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Manpower and Pricing Hamper Supply

Midwest Market Expects No Material Increase For Some Time — Hinde & Dauche Plan New Box Plant In Boston—Announce Final Paper Salvage Drive—Packing Clinic To Meet—Other Late News.

CHICAGO, Ill., September 10, 1945—Publicity which has been given to the "near normalcy' of peacetime has been given the paper trade in this area a real headache. There is a marked inclination on the part of jobbers and all users to expect a lot of paper right now. Their desires are natural but those in the manufacturing and sales end of the trade report that they "know differently." Actually, say local paper trade men, there won't be any increase in the supply of paper for some time because of labor shortages and lack of what one executive caled "productivity weapons" including pricing uncertainties.

Those who are not expecting immediate shipments of all kinds and sizes are equally persistent in expecting an immediate resumption of pre-war quality. Satisfying this requirement, according to the local trade, is just as difficult as taking care of orders for there are reportedly no proper raw materials to as yet even approach pre-war quality. After things are "set," however, the story will be different as far as quality is concerned for there are plenty of plans, many of them announced, for real progress along these lines.

Meanwhile, there was little news concerning specific markets. No change in M-93, covering pulp production and no immediate effect in the reduction of the pulp distribution order M-241, to 20% of production cause the local trade to just more or less sit and hope. Prices are at the ceiling peak and, in many cases, far too low to take care of peacetime requirements when peacetime services and volume come back.

Hinde & Dauche Announce Plans

The Hinde and Dauche Paper Company which maintains sales headquarters and a huge warehouse facility in Chicago, is just out with oue of the most optimistic pronouncements yet released. Officials of the company this week predicted record sales volume for many years to come and gave widespread local publicity to the prediction which emanated from Sandusky, Ohio, headquarters. Since V-J day, spokesmen said, cancellation of contracts has proceeded in orderly manner and production on the large backlog of orders for shipping boxes, envelopes and other containers, is being stepped up along with extensive expansion and improvement of production facilities.

The company plans a new corrugated shipping box factory in Boston and additions will be made to manufacturing facilities at Buffalo, and warehouse facilities at the Hinde and Dauche Chicago plant are being expanded. Equipment and building at the Fort Madison, Iowa, plant have been modernized and new equipment has been installed at all factories and mills throughout the United States with more machinery on order.

Along with all construction developments, the package laboratory is expanding to take care of the demands for service demands and for products being designed in the package and shipping box field. The war itself gave Hinde and Dauche the background to develop many new lines, added finishes, coatings and colors stemming directly from wartime operations. As soon as sufficient board is available these perfected ideas will be made into finished products and merchandised extensively. Such new lines as egg cases, fruit and vegetable boxes, music stands, merchandise floor stands, shelf packages, gift boxes and tote trays are among the items for which Hinde and Dauche expect big things "quite soon."

Paper Leader Begins Fund Campaign

The Chicago Community and War Fund really got under way this week under the direction of Walter P. Paepcke, general chairman and chairman of the board of the Container Corporation of America. Among the larger contributions announced at a series of "kick-off" meetings over which Mr. Paepcke presided was a gift of $25,000 from the Container Corporation itself. The actual campaign is supposed to start October 1 and wind up around Christmas time. Evidently, Mr. Paepcke believes in getting an early start.

Salesmen Plan to Resume Meeting

The western division of the Salesmens Association of the Paper Industry will resume its regular weekly noon luncheons at the Sherman Hotel on Monday, September 10, after a two weeks stretch which found the SAPEYES enjoying Labor Day instead of discussing many current problems. According to Pat Patterson, Flambeau Paper Company, western vice president, the next meeting will be a round table discussion affair revolving around controls and when they will be lifted.

Plan Final Salvage Drive

Five thousand Boy Scouts will operate 700 trucks in Chicago's final city-wide curb paper salvage drive on September 15. Plans for the big effort were announced this week by J. R. Robinson, paper salvage chairman for this area. The Chicago city hall, the county building and the war agencies buildings will all begin their fall clean-up drive this week to get ready for the Scout pick-up. The War agencies

(Continued on page 21)

To End Weight Limitations Soon

WASHINGTON, D. C., September 12, 1945—Early revocation of paper and paperboard simplification and standardization controls has been recommended to the War Production Board by representative paper distributors to relieve industry of wartime paper weight limitations as soon as possible, WPB announced today. The recommendation was made yesterday at a meeting of WPB's Paper Distributors Industry Advisory Committee, with the understanding that revocation of the pulp allocation order was being considered and that adequate pulp supplies for the fourth quarter would soon be available.

Although the printing and publishing orders, except that controlling the use of newsprint, have been revoked, as well as a number of the paper and paperboard orders, WPB officials pointed out that the simplification and standardization order (L-120), together with its several schedules, was still in effect, and that existing restrictions on use must be complied with until removed by WPB. Compliance based on infractions of Order L-120 during its existence will be enforced, officials said, even after it is revoked.

Continuance of the over-all paper and paperboard conservation order (M-241) was discussed by committee members who said that all paper controls should be removed as soon as possible. They asserted that the reserve production requirements were adequate to meet current governmental demands, and that control of merchants' inventories was no longer necessary.

Commenting on the paper situation, Grant Richardson, director of the Paper Division and Government presiding officer at the session, said that the wholesale distributor of paper, indispensable in war, was also vital to reconversion. He likened the merchant to the "right arm of the mill." Paper supplies and demands are not exactly in balance yet, although the general pattern of production will be similar to that of the last few years, he said. The wholesale paper trade itself now must closely police distribution, seeing to it that hoarding, speculative buying and inequitable distribution are avoided in the interest of public economy, Mr. Richardson pointed out.

Reviewing the present situation since the revocation of all printing and publishing orders except the newsprint order, Robert D. Ross, of the Printing and Publishing Division, reported that even during the stress of war most printers and publishers received a greater area of printing papers than ever before, although less in tonnage because of weight reductions. There were more books and magazines printed than usual, and, although commercial printing decreased during the war, it is now increasing.

He predicted that the demands of the military services for reading material, playing cards, administrative papers and certain other printed matter will continue for some time, at least until demobilization is completed. He added that the Government had been a heavy purchaser during the war period, especially of lithographic printing.

The entire paper industry was credited by WPB officials with doing a fine production job under heavy wartime handicaps and without priority aid. The officials added, however, that during the next few months certain production problems would have to be overcome; among these difficulties are the continued shortage of rosin and certain other scarce materials, shortage of skilled labor, and the readjustment and retraining of many returning veteran employes.

M. E. Cody Appointed By OPA

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 12, 1945—M. E. Cody has been appointed price executive of the Paper and Paper Products Price Branch, succeeding J. R. Atwater, who has resigned to return to private industry, the Office of Price Administration announced today.

Mr. Cody, a business man associated with the paper industry all his life, served with the War Production Board since August 1943 as assistant to the director of the paperboard division.

Prior to joining WPB, Mr. Cody was for three years resident manager of the Savannah. Ga., plant of the Union Bag and Paper Corporation. From 1928 to 1939 he was general manager of the Bogalusa Paper Corporation, Bogalusa, La. From 1924 to 1928 he was manager of the Tennessee Extract Corporation, Nashville, Tenn., and from 1922 to 1924 he was resident manager of the National Paper Products Company, Stockton, Cal.

WPB Suspends Classic Comics

The War Production Board has interrupted the business of publishing comic magazines by issuance of a suspension order, against the publishers of "Classic Comics" whose alleged violations during the year 1944 of one or more of the WPB limitation orders L-240, L-241, L-244, and priorities regulation 7A, resulted in diversion of approximately 621,498 tons of newsprint paper which was in critically short supply throughout this war year, according to Philip S. Hardy, regional compliance manager of the War Production Board. "Classic Comics" was published by Gilberton Company, 510 6th Avenue, New York City.

All publishers involved in these violations are prohibited from using any newsprint for printing or publishing magazines, newspapers, periodicals or books so long as the allocation of such newsprint or paper is governed or controlled by any order or regulation of the War Production Board.

Amends Rosin Order

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 5, 1945—More rosin will be available for civilian purposes as a result of an amendment to Order M-387, governing rosin, the War Production Board reported today.

This action will be retroactive over the last half of the third quarter, and base periods should be recalculated for the new Schedule A products to include both the military and the civilian use for the corresponding quarter of 1944. Schedule B quotas had been based on civilian use only.

While the amendment will make a greater quantity of rosin available for civilian use because of military cutbacks, it will not result in an over-all increase in the consumption of rosin, WPB pointed out.

Michigan Superintendents to Meet

The first fall meeting of the Michigan Division of American Pulp and Paper Mill Superintendents Association will be held on Thursday, September 20, at the Park-American Hotel in Kalamazoo, Mich. Dinner will be served at 6:30 p.m.

Mr. J. G. Rearick, representative of the Warren Steam Pump Company, will speak on "Paper Mill Pumps."

Forester Discusses Small Timber Growing

Plan To Give Network Demonstration To Aid In Scientific Harvesting Small Wooded Areas—To Rebuild Old Neenah Mill—Kimberly-Clark Workers Attend Safety Rally — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 10, 1945—F. B. Trenk, Madison, Wis., state extension forester, discussed timber growing by the small landowner, in an address Wednesday, September 5, before the Wisconsin Rapids (Wis.) Rotary Club. He pointed out that there is an outstanding difference between the handling of forest crops by the small owner and the industrial owner.

The small land owner, he said, should handle his trees like a crop and take out a volume of wood each winter, rather than "mine" the crop just once. Thus he is assured a continuous income.

It is planned to have a network demonstration on forests with an annual "timber harvest" in the area, Mr. Trenk reported. At these harvest days, the growth will be visualized each year.

"This section has a forest-growing soil; the industries which utilized timber are here, so it's a natural," he said. "We are trying to develop in the mind of the landowner the concept of trees as a crop to be harvested at frequent intervals. He also told how farmers recently began to think of forestry as an opportunity to use waste land beneficially, and discussed the development of the tree-planting machine to "take the backache out of the work."

To Rebuild Old Neenah Mill

Kimberly-Clark Corporation, Neenah, Wis., last week took out a city building permit for the $50,000 remodeling project on the old Neenah mill. The project will give the corporation a new laboratory and technical department that will cover approximately 60,000 square feet.

Work has already been started on the project, which includes cleaning up the exterior brick of the building and transforming the interior into a modern laboratory building with offices and a library.

The new addition, which is expected to be ready for occupancy after the first of the year, will include 20 rooms and offices with asphalt tile floors and asbestos fireproofed wallboard, which will be painted. Fluorescent lighting fixtures are to be installed in all the rooms.

Allan L. McKay Heads Kaukauna Corp.

Allan L McKay, who was elected president of the Kaukauna Machine Corporation, Kaukauna, Wis., at a recent meeting of the board of directors, assumed the office September 1. He will continue as general manager, a position he has held since June, 1942. when he was elected vice president.

Mr. McKay succeeds Lieutenant Colonel Ralph J. Kraut, who resigned at Kaukauna after his release from service, in order to devote all his time to his position as president and general manager of the Giddings and Lewis Company, Fond du Lac, Wis. He will, however, serve as vice president and treasurer of the Kaukauna Machine Corporation.

Employees Attend Safety Rally

Between 800 and 900 employes of the Kimberly, Wis., mill of Kimberly-Clark Corporation attended a safety rally at the village clubhouse on Wednesday, September 5. All seats on the main floor and in the balcony were filled and standing room was at a premium. Similar programs will be held monthly. All workers were allowed time to attend the meeting, including the day shift. A magician performed during the meeting, after which a safety quiz program was held. The Community band furnished music.

Bryant Laboratory for Time Research

KALAMAZOO, Mich., September 5, 1945—Construction was started today on what is expected to be one of the most modern and complete research laboratories in the country, Allan B. Milham, president of the Bryant Paper Company, announced today. The building will be located in Alcott avenue across from the Bryant division. The new laboratory is being built by the Bryant Paper Company to house the research work for Time, Inc., and its subsidiaries. It will be devoted to the future progress of the graphic arts industry, in which paper plays such an important part. In this laboratory papers will be created not primarily to have superior appearance, but because they possess the necessary qualities for the use to which they will be put.

D. Robert Erickson, Kalamazoo consultant, is responsible for the new project and will direct the research.

"Papers will be created and developed here as one of the essential parts of a finished product . . . a finished product produced by the combined efforts of the paper maker, the ink maker, the artist, the plate maker, the press manufacturer, and the pressman," Erickson said. "By considering the end use and the association of paper with their other phases of the graphic arts industry, we feel real steps forward can be made in paper manufacturing."

Philip H. Noyes Dies

Oliver United Filters Inc. announces with deep regret the sudden death in Chicago on August 18, 1845 of Philip H. Noyes one of its most valued engineers. He was 43 years old.

Mr. Noyes joined the company in 1937 as Technical Filtration Engineer first in the Western Sales Division at San Francisco, California and for the past several years in the Chicago Sales Office. Widely known throughout the process industry, particularly in the food products and chemical field, "Phil" Noyes leaves a host of friends.

A.P.P.A. To Study Weight Basis

At a meeting of the Standing Committee on Simplified Practice of the American Paper and Pulp Association, Recommendation R22-40 on September 5th to consider proposals relative to the 1000 sheet count —1000 square inch method of calculating basis of weight, it was decided to submit a proposal to manufacturers, dealers and consumers of paper. The proposal to be submitted is to be based on the report of the National Paper Trade Association just issued concerning this subject.

Michigan Carton Co. To Expand

Lawrence G. Fell, president Michigan Carton Company has written his stockholders that, during the war paperboard assumed a role of increasing importance in the packaging of munitions and supplies. This was but an acceleration of the rising trend clearly evident during the last ten years.

With confidence in the peace time future of the paperboard industry your management has completed plans and contracts for the construction of a new board mill on an 18-acre tract one mile west of its present plant and adjoining its present storage warehouse. This property is now served by both New York Central and Grand Trunk railroads. The paperboard machine proper will be built by Beloit Iron Works, Beloit, Wisconsin. It will be a high speed machine with several newly developed features, including a machine coating process to be operated under the K.C.M. license. This type of coated board, a new and improved grade, is expected to grow steadily in demand because of its superior printing qualities.

The stock preparation equipment will be built by Shartle Brothers of Middletown, Ohio, and is designed for economical use of labor being thoroughly mechanized. Power plant contracts have been let to Springfield Boiler Company, Springfield, Illinois, and Westinghouse Electric Company, Schenectady, New York. The tonnage capacity of the new mill will be at least equal to our present two machine mill. It will cost approximately 2½ million dollars and will furnish employment for about 125 men. Necessary funds for this project have been provided through bank loans.

Construction of buildings can commence just as soon as labor and materials are available.

Rowlett Leaves Army for Brown-Bridge

TROY, Ohio—Major R. S. (Stew) Rowlett is now associated with the Brown-Bridge Mills, Inc. A veteran of World War I, Rowlett was called back by the War Department in 1942 for special work in connection with the manufacture of Garand rifles at Springfield Armory.

"Stew" Rowlett is well known in the paper trade, having been active in various phases of it. For several years just prior to return to military service he had been connected with McLaurin-Jones Company of Brookfield, Mass.

The Brown-Bridge Mills during the war developed new specialties which the company hopes to introduce commercially in the near future. In anticipation of this Rowlett is spending a few weeks at the plant after which he is expected to take up residence in the East where he will engage in promoting the use of Brown-Bridge Products.

Robins and Hewitt Open in Charleston

To render better service to the mines and industrial plants in the West Virginia territory, Robins Conveyors Inc. and its affiliate, Hewitt Rubber Corp., have opened a new office in the United Carbon Building in Charleston, W. Va. R. U. Jackson, who has represented Robins Conveyors in the territory for 15 years, will be in charge of the office, assisted by H. N. Kepler, sales engineer formerly in the Robins Washington office.

Handling Hewitt sales will be Nelson J. Reinhold, who has recently joined the company after 14 years with Cincinnati Rubber Co.

Parker-Young Will Increase Output

LINCOLN, N. H., Sept. 10, 1945 — Work has started on a contract with the Sandy Hill Iron and Brass Works, Hudson Falls, N. Y., to rebuild the Parker-Young Company's No. 1 machine at a total cost of $300,000.00 to $325,000.00 for machine and beating equipment installed.

Present speed rating of 200 to 400 feet will be widened to 700 to 750 feet. The weight range will be increased to the heaviest index. Capacity will be increased from 35 tons daily to 50 tons.

The latest developments in paper mill engineering will be incorporated. These include hypoid drives powered by a Westinghouse high speed turbine; new beating and Jordan equipment and vortraps to clean the stock. The machine will be lengthened to accommodate a complete new adjustable Fourdrinier unit and additional drying capacity, automatically controlled. Miscellaneous new equipment includes a Bertrams flow-box, suction couch, chromium plated smoothing press, size tub, Pope reel, and Walsh-Witham "Scotch Mist" shower pipes.

Regulating devices which are expected to insure the cleanest tolerances will be included. These will be tied in with the extensive control system pioneered by Parker-Young several years ago which is considered one of the finest in the industry.

Opaque papers will be provided for, particularly with regard to maximum retention of opacifiers such as Titanium.

Union Bag Advances Nicholson, Dunn

SAVANNAH, Ga., Sept. 9—T. T. Dunn, manager of the pulp and paper division at the Savannah plant of Union Bag and Paper Corporation, will become resident manager of the plant, effective October 1, according to announcement by Alexander Calder, president. Mr. Dunn succeeds G. W. E. Nicholson, who is being promoted to the post of manager of mills and factories for Union Bag and Paper. Mr. Nicholson's headquarters will be in New York.

"As manager of mills and factories," Mr. Calder stated, "Mr. Nicholson will be in charge of the manufacturing operations at Union Bag's Savannah and Hudson Falls, N. Y., plants. The Hudson Falls plants include a large bag factory, a laminating unit, a research division for product development, and a unit which develops bag making machinery."

Mr. Dunn, the new resident manager here, came to Savannah in 1940 from Bogalusa, La., where he was chief engineer of a paper mill with which he was associated for thirteen years. He holds a degree from Louisiana State University. He is a member of the board of trustees of the Georgia Infirmary and is identified with many other worthwhile civic projects.

Wholesale Volume Up 3 Per Cent

WASHINGTON, D. C., September 11, 1945—Wholesalers' sales of paper and paper products totaled $51,147,000, for the first seven months of this year, a gain of 3 percent over the same period of 1944, according to the Bureau of Census, based on reports from a representative group of firms in this field.

Sales for July totaled $5,677,000, a decline of 3 percent from June, but 13 percent higher than for July last year.

Inventories of a reporting group showed no appreciable change in July compared with June, but were 20 percent below those of July, 1944.

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PIPE PREFABRICATION

Complete facilities for the fabrication of every type of piping . . . pretested before delivery.

PIPE SUSPENSION

Constant-Support Hangers for constant support of piping in all "hot" and "cold" positions . . . full safety factor of the supported system always maintained . . . individually calibrated . . . minimum headroom required.

Engineered Spring Hangers . . . stock hangers for loads ranging from 84 lbs. to 4700 lbs. Change in supporting force of hanger held below 12½% in ½" vertical travel of piping.

Years of experience in interpreting piping requirements, strategically located pipe fabricating plants, and the most complete line of pipe hangers . . . these are the reasons why Grinnell supplies piping and hangers exactly suited to the individual layout. GRINNELL COMPANY, INC. Executive Offices, Providence 1, R. I. Branch Warehouses in principal cities. PIPE Fabrication Plants: Providence, R. I., Atlanta, Ga., Warren, Ohio.

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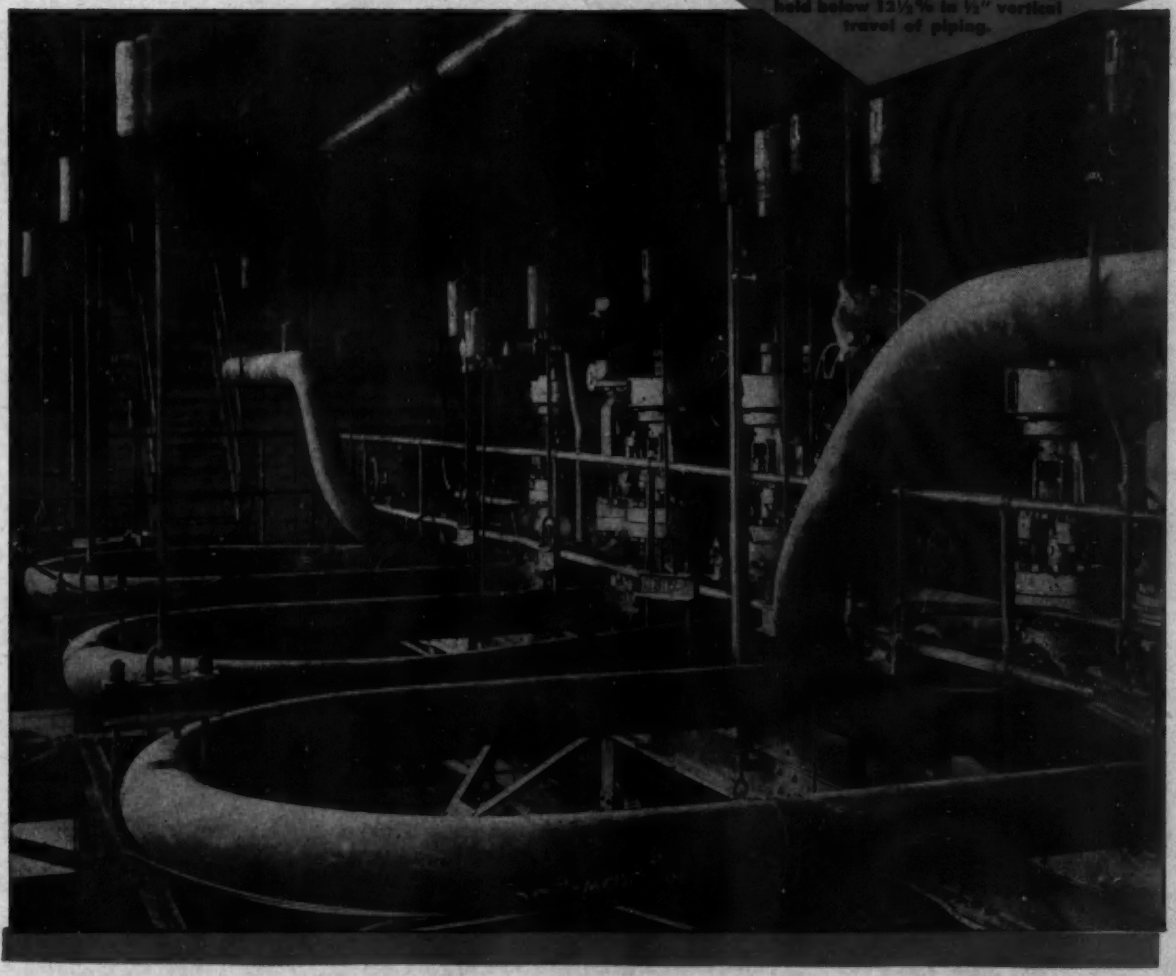


Holyoke Mills Seek More Help

HOLYOKE, Mass., Sept. 8—Convinced by the first few days of peace that they can handle the problems of reconversion easily, paper mill officials here have squared off to meet demands for civilian production. The city was not rocked badly by the reconversion blow, with the paper mills rolling right along, making the same items they always have. The paper industry had no mechanical shakeup during the War.

The National Blank Book Company is the only local paper concern which went into new fields during the war. It wound up its Browning gun division several months ago and is well on its way toward reestablishing its civilian goods program.

The paper mills, hard-pressed for labor for more than three years, have gotten a few recruits from the mounting list of those laid off in the war factories.

Officials of these plants, however, don't expect any substantial relief for several weeks, until the former war workers have vacationed a bit and find out for certain whether or not they are going to get positions after reconversion.

The American Writing Paper Corporation is prepared to increase operations at the Gill division to a 24-hour basis. All during the war, this large mill has been running but 16 hours a day because of a lack of help. A paper mill should run the clock around to obtain the maximum efficiency, plant officials explained.

Urge New Pay Scale on Monsanto

SPRINGFIELD, Mass., September 8—Paper mill officials in Western Massachusetts are watching with interest a labor dispute at the Monsanto Chemical Company here which is admittedly a "test case" which will set the tempo for labor relations throughout the Connecticut Valley. The issue involved is premium pay with the union demanding time and a half pay for Saturdays as such and doubletime pay for Sundays and holidays as such without regard for the number of hours worked in any one week. The company offers time and a half pay for the sixth consecutive work day and time and half pay for Sundays and holidays as such and double time for seventh consecutive working day.

The outcome of this dispute will govern the demands of other unions in this area. If the company wins, the other plants will refuse union demands of a like nature, but if the union is successful, the other labor leaders in the area are determined to fight for the same concessions.

At present the union has voted a 30-day "cooling off" period under the provision of the Smith-Connolly act to let federal agencies seek to mediate the dispute.

APPA Presents Price Study

A study of "Thirty One Years of Paper Prices" has just been completed by the statistical staff of the American Paper and Pulp Association. The project covers the period from January, 1914, through July of 1945 and thus it starts six months before World War I and ends at the practical close of the fighting period of World War II. The broad price movements throughout this eventful period, it is hoped, will furnish an interesting and helpful background for evaluating the present unusual price conditions.

Continental Can Acquires Gould

LYONS FALLS, N. Y., Sept. 12, 1945—Continental Can Company has acquired the stock of the Gould Paper Company, manufacturers of ground wood specialties. In announcing this acquisition, Carle C. Conway, chairman of the board and president, pointed out that these new properties, which include plants and natural resources, will permit Continental to expand its operations in both paper and plastics. He referred particularly to newly developed methods for the preparation of high-grade pulps for paper specialties, and to plans for developing and expanding the company's manufacture of plastics products.

The Gould Paper Company has been under the direction of the Gould family since 1892, when it was founded by G. H. P. Gould, a pioneer in the development of the paper industry in New York state.

The properties consist of extensive timber holdings of virgin stands of Adirondack spruce and hard woods, and include large developed and undeveloped water power. The Moose and Black rivers amply supply the large quantities of water required daily for mill operations. During high water they also carry cut pulp wood to the main mill located at the junction of the two rivers.

The principal properties are completely integrated from a manufacturing standpoint. They include sulphite and ground wood plants, with a three-machine paper mill at Lyons Falls, a one-machine paper mill at Port Leydon, and four separate ground wood mills located at various falls on the Moose river, which take advantage of part of the already developed water power.

Continental Can will continue these operations under the name of the Gould Paper Company, and will manufacture, sell and expand the grades of ground wood specialties now being produced. R. W. Shaver will continue as vice president and general manager, with complete responsibility for overall operations, and other personnel will be retained.

Favor New Mead Corp. Mill

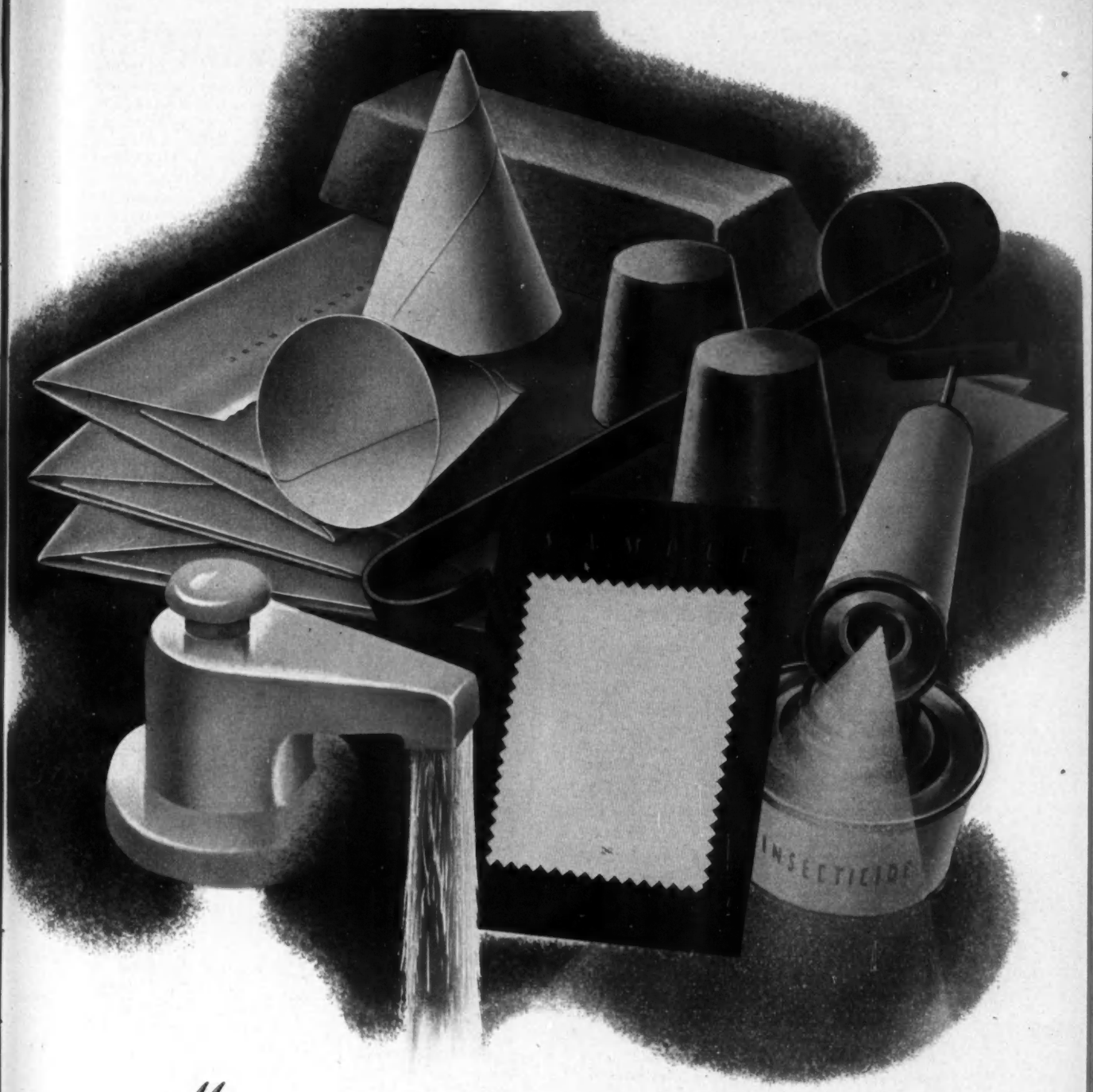
Approval of residents of other cities, in which paper mills and pulp plants are located, seem to outweigh objections, a survey just completed by the Macon, Ga. Telegraph disclosed.

After some opposition was voiced here following disclosure of proposed plans of Mead Corporation, of Dayton, Ohio, to locate a $10,000,000 container board plant in Macon, the Telegraph checked with authorities in other cities regarding the reported unpleasant odors of a pulp mill. The plant proposed to be located in Macon would have an annual payroll of one million dollars and provide jobs for 600 men.

Various opinions have been expressed. Some say "They do smell for miles around." Others declare they have gotten used to it, and others explain that they gladly forego the odors in order to get the million-dollar-a-year payroll and the provision of employment.

Jones Refiners for St. Regis, Taggart

The St. Regis Paper Company at Deferiet and the Taggart Corporation at Oswego and Carthrage have ordered several Refiners built by E. D. Jones & Sons Co. Some of this equipment is already in operation.



Many materials and processes contribute to the making of a smart white fabric... pulp and paper... an ingot of pure metal... potable water... or an insecticide. But to all of these... and many more... "$Cl_2^{\prime\prime}$ is an important common denominator. In producing liquid chlorine and the other basic chemicals of its manufacture to the highest standard of purity and uniformity, Niagara is ever mindful of its responsibility as a leading and pioneering factor in America's great electro-chemical industry.

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Moses Estate to Boy Scouts

SPRINGFIELD, Mass., September 1, 1945—Horace A. Moses, chairman of the board of directors of the Strathmore Paper company of West Springfield, has sold his 1200-acre estate in Russell to the Hampden County Council, Boy Scouts of America.

Scout Commissioner John C. Norsk disclosed the purchase but declined to reveal the price paid for the estate, which includes an 86-acre lake.

Norsk said it was obtained from Moses "at a price in keeping with his many philanthropies," and said Moses had specified that the sale price was not to be made public.

Although Moses deeded the property to the Scouts, who will use money realized through waste paper salvage for the first payment, he and his wife will retain use of the large residence and other buildings on the estate, under the provisions of the sale.

The buildings will eventually be turned over to the Scouts, Norsk said, presumably on the death of Moses and his wife.

The camp will be known as the Horace A. Moses Scout reservation.

Cooper Forms Alloy Valve Division

Certified Alloy Valve Company has been formed as a new division of The Cooper Alloy Foundry Co., Hillside, N. J. The new company will specialize in the manufacture of stainless steel valves for which it will furnish a certified analysis of every part which comes in contact with liquid. P. C. Shaffer is chief engineer. Products will be sold through Cooper.

Corn Products Promotes Schmitt

Promotion of Edward W. Schmitt to the position of bulk sales manager is announced by Corn Products Sales Company. Previously he had served as division sales manager for the confectionery, bottling, canning and meat packing industries. In his new capacity Mr. Schmitt will assume the responsibility for bulk sales development and the introduction of new industrial products perfected by the Company.

MANPOWER, PRICING, HAMPER SUPPLY

(Continued from page 13)

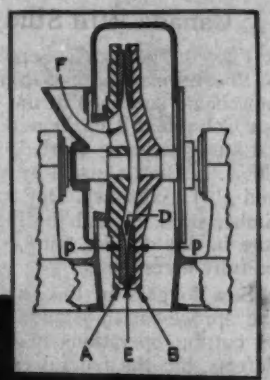
building will, for example, bale and place on the sidewalk thousands of circulars which were made obsolete when the war ended. Paper still is at the top of the list of materials of which there is still an extremely critical shortage, according to James T. O'Connor, executive secretary of salvage for the War Production Board. He said a goal of six million pounds has been set for the September 15 collection. Money derived from the sale of paper gathered in the pick-up will be donated to servicemens centers and also will be used for the benefit of hospitalized war veterans.

Packing Clinic to Meet

Because of late improvements in the quality and durability of paper as a packing agent, the paper trade is expected to take more than its ordinary share of interest in a Packing Clinic to be held at the Furniture Better Packing Meeting and Clinic to be held in Chicago on September 11. In line with continued attempts to devise means of lowering damages to goods in shipment top officials of companies dealing with packages and packing problems, and packing room foremen, will be on the speakers list.

Bauer Pulpers are in service in: The United States, Canada, Mexico, Hawaii, New Zealand, Australia, India, Sweden, Russia.

Stock enters at F; passes between Plates PP at D, positioned between Disks A and B . . . and is discharged at E.



GRADES ON WHICH BAUER PULPERS ARE HIGHLY EFFICIENT

Long, Pliable, Free Fiber, from Many Different Raw Material Sources for Almost Every Grade of Finished Output.

The tabulation of actual mill applications below will interest you—give you a clear picture of the range of work obtainable with Bauer equipment.

- For all types of Insulating Board and Wallboard and Hardboard Production and for Plastics of Various Grades.
- Semi-Chemically Cooked woods for Manufacture of .009 for Corrugating and for Wallboard.
- For removal of shive from Soda Pulp for printing paper.
- For manufacture of Newsprint, special Wrapper Stock, Board, and Specialties.
- For production of various grades of Kraft Board and Kraft Bag Papers.
- For use in Paper Board Manufacture as filler and Liner; for Auto Panel Board; for Wallboard Filler; in preparation for De-inking Processes; wherever freeness, freedom from cutting, uniformity, and complete defibering is required.

THE BAUER BROS. CO.
SPRINGFIELD, OHIO

Canada Will Study Use of Balsam

VANCOUVER, B. C., September 7, 1945—Possibility of the utilization of balsam for pulp production is now being surveyed in the Fort George area of British Columbia. This Dominion government pathological study is being carried out under the direction of Dr. J. E. Bier, assisted by V. J. Nordin, R. E. Foster, and P. J. Salisbury. Due to the decreasing supply of timber in B. C. and the likelihood of pulp manufacture in this district, future utilization of balsam is to be fully investigated.

Saw loggers in the past have ignored balsam in the spruce-balsam stands which constitute the bulk of cutting operations in the district, due to certain defects, but the federal experts, who will be assisted in their work by a falling and bucking crew, hope to disclose means whereby balsam may be fully utilized.

Smith Maintains 48 Hour Schedule

LEE, Mass., September 8—The Smith Paper, Inc., facing "hardly any" reconversion problem, is now trying to employ 30 additional laborers for permanent positions. The company will maintain its 48-hour a week production schedule. The plant has been closed for the past week for annual vacations but was scheduled to reopen on September 10.

Gaylord Container Expands

The Gaylord Container Corporation, a press report states, will begin construction of three corrugated and fiber box plants within the next sixty to ninety days costing $4,000,000.

IDEAS WANTED!

IDEAS, INVENTIONS OR PATENTS RELATIVE TO PROCESSES OR EQUIPMENT USED IN PULP MILLS

One of our clients, a large manufacturer of heavy equipment, is interested in extending its activities in the pulp mill field. Accordingly, it solicits ideas, regardless of stage of development, that may lend themselves to new or improved processes or equipment applicable to pulp manufacture.

Those interested are invited to write to the undersigned stating type of process or equipment but not making any confidential disclosure. A form of agreement for making disclosures will then be supplied.

G. M. BASFORD & CO.
DEPT. D
60 E. 42nd STREET, NEW YORK, N. Y.

Aluminum To Triple Output

NEW YORK, September 10, 1945—Steady decreases in the cost of aluminum products will enable the industry to expand to the point that it will within five years employ three times the number of persons it employed before the war, Roy A. Hunt, president of the Aluminum Company of America said last night in an address over the Mutual Broadcasting System. Mr. Hunt's address was one of the mutual Network's "Reconversion and Jobs" series presented with the cooperation of the nation's business industrial and government leaders.

"The aluminum industry today is figuratively beating war planes and tanks into railway cars, bowling alleys, canoes, houses, doors, bicycles, pots and pans and several thousand other items we believe will contribute greatly to your future comfort and economic well-being," Mr. Hunt said.

"The aluminum industry does not have the tremendous physical job of reconversion that the automobile industry is tackling so efficiently right now. We do not have to change from the manufacture of guns to the manufacture of cars, but we do have a reconversion job, just the same.

"Some of the machinery installed and working on VJ Day was suited only to turn out specialized aluminum products for war. The different alloys needed for peace-time products require numerous plant adjustments. However, these changes can be made with promptness although at substantial expense.

Our big reconversion is not a physical one. Rather, it is to find enough buyers and users of aluminum to employ our productive capacity.

"The United States now has within its borders the plants to produce more than 2 billion pounds of aluminum a year. This is fortunate because the war this nation has just won has been so largely an air war. That made it a war of aluminum, for three-quarters of the average plane, by weight, is aluminum.

"Back in 1938, anticipating a growing demand for aluminum from the aircraft industry, our own company began a plant expansion program that was to lift its producing capacity from 350 million pounds a year to more than 830 million pounds a year. This resulted in a capacity to produce more than seven times as much aluminum annually as the entire national market absorbed in any prewar year.

"So you can see that our principal reconversion task is the industry-old problem of selling the aluminum we are able to make with our greatly expanded facilities."

Pennsalt Shows How It's Done

PHILADELPHIA, Pa., September 7, 1945—Pennsylvania Salt Manufacturing Company has just published an attractive booklet entitled "Salt of the Earth" which describes its mechanical exhibit at the Franklin Institute. This exhibit presents a simulated working model of a chlorine-alkali plant in actual operation. The center spread illustrated in this booklet is a photographic reproduction of the exhibit as it appears in the Institute. Sections of the model appear on the pages to help clarify the descriptions of the various processes.

A three dimensional model of the chlorine atom is part of the Pennsylvania Salt Manufacturing Company's exhibit. The "Salt of the Earth" booklet shows some of the current conceptions of the chlorine atom and the origin of the chemical and physical properties peculiar to this element.

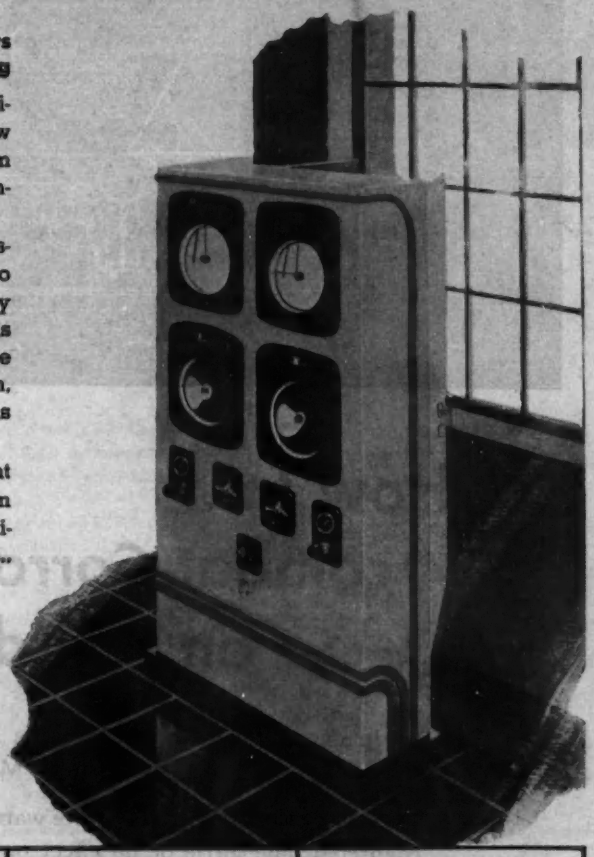
The Last Word, IN AUTOMATIC CONTROL FOR SULPHITE DIGESTERS!

New compact Universal Control System offers new high quality and economy in pulp cooking

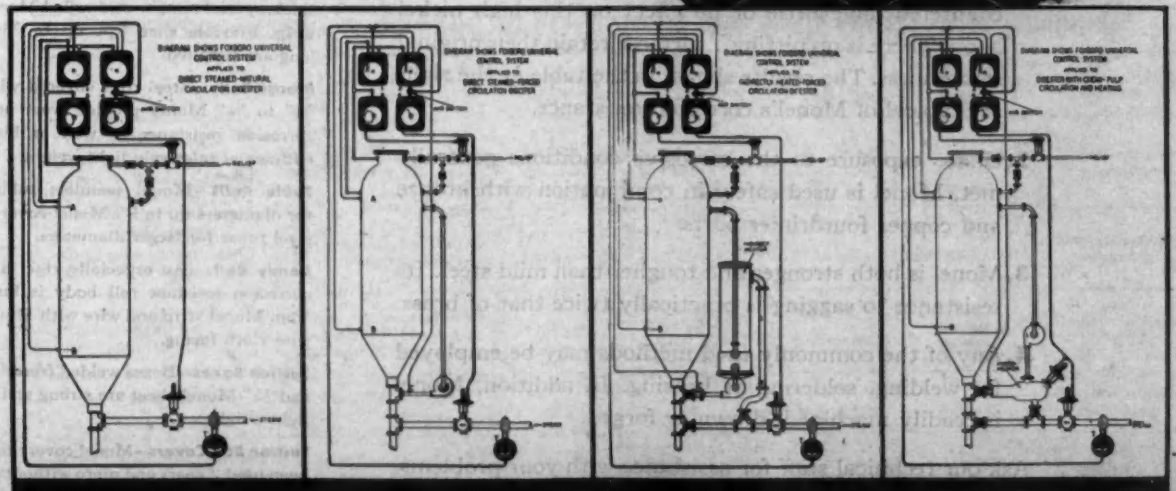
From more than 20 years of down-to-earth experience in pulp-cooking instrumentation, Foxboro now has developed a complete "packaged" control system that sets a new high in combined performance, convenience and versatility.

Unaided, the new Foxboro Universal Control System regulates digester heat input and gas relief so that cooking pressure and temperature follow exactly prescribed schedules from start to finish. Further, this efficient modern unit is equally suitable for any type of sulphite digester – natural or forced circulation, direct-steamed or externally-heated. (See diagrams below.)

Write for detailed information on this important advance in sulphite digester control. Also data on similar "packaged" control systems for alkaline digesters. **The Foxboro Company, 158 Neponset Ave., Foxboro Massachusetts, U. S. A.**

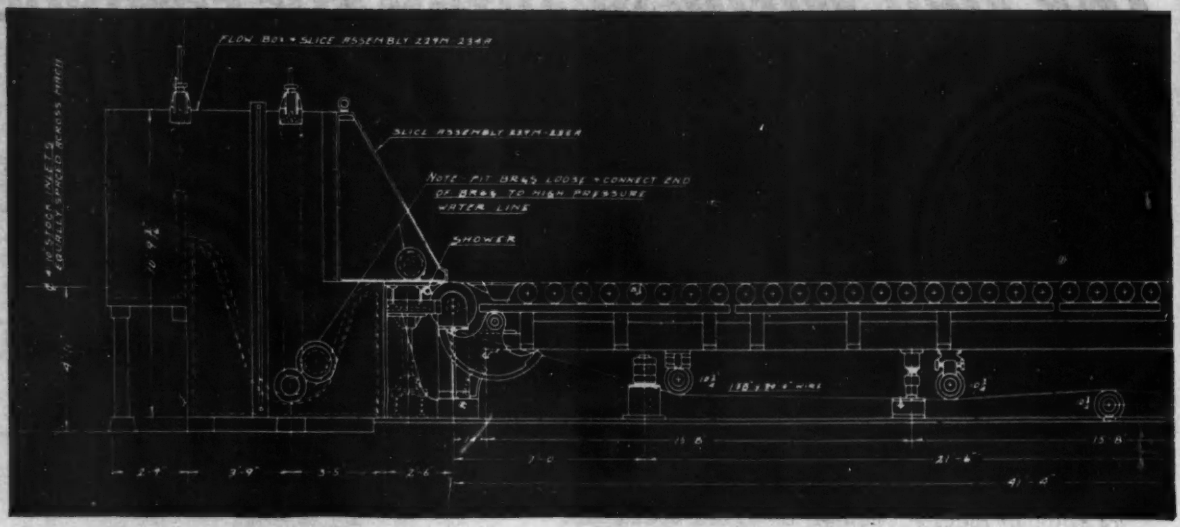


Foxboro Automatic Digester Control Unit. Supplied complete with following instruments ready-mounted in a modern protective steel cabinet: 1. Foxboro Steam Flow and Liquid Level Recorder with Steam Flow Integrator (top left); 2. Foxboro Dynalog (electronic) Three-Point Temperature and Top Pressure Recorder (top right); 3. Foxboro Cam Schedule Pressure Controller (lower left); 4. Foxboro Cam Schedule Steaming Controller (lower right).



FOXBORO
REG. U. S. PAT. OFF.

AUTOMATIC
DIGESTER CONTROL



How to combat Corrosion on Fourdriniers

When planning essential replacements and future fourdriniers, consider these advantages of Monel:

1. Corrosive paper stocks and white waters as usually encountered have little or no effect on this high nickel alloy. There is no pitting...surfaces retain their original smoothness. The results shown in the table at the right are typical of Monel's corrosion resistance.

2. Under exposure to the corrosive conditions generally met, Monel is used safely in combination with bronze and copper fourdrinier parts.

3. Monel is both stronger and tougher than mild steel. Its resistance to sagging is practically twice that of brass.

4. Any of the commonly used methods may be employed for welding, soldering or brazing. In addition, Monel is readily machined, drawn or forged.

Ask our technical staff for assistance with your problems. Among the helpful publications available are *"Selection Guide to 28 Problems on Fourdriniers"* and Bulletin C-3 *"Monel, Nickel and Inconel in Pulp and Paper Mills."* Write for copies.

PRINCIPAL USES OF MONEL ON FOURDRINIER WET ENDS

Flow Boxes—Monel linings from .037" to ⅛" thick are applied to wood or steel boxes. Some are of self supporting Monel sheet construction, or built from nickel-clad steel.

Flow Box Midfeathers—Wood construction lined with .037" to .062" Monel sheet.

Apron Plates—Monel strip from 1/16" to ½" thick, supported by steel frames.

Slice Blades—(flat bar type and flexible slices). These are of ⅛" to ¼" thick, special temper cold rolled Monel strip. Flexible slice lips up to 250" long are supplied.

Breast Rolls—Steel rolls covered with ⅛" to ¼" Monel provide wear and corrosion resistance as well as high stiffness at relatively light weight.

Table Rolls—Monel seamless tubing for diameters up to 5". Monel-covered steel tubes for larger diameters.

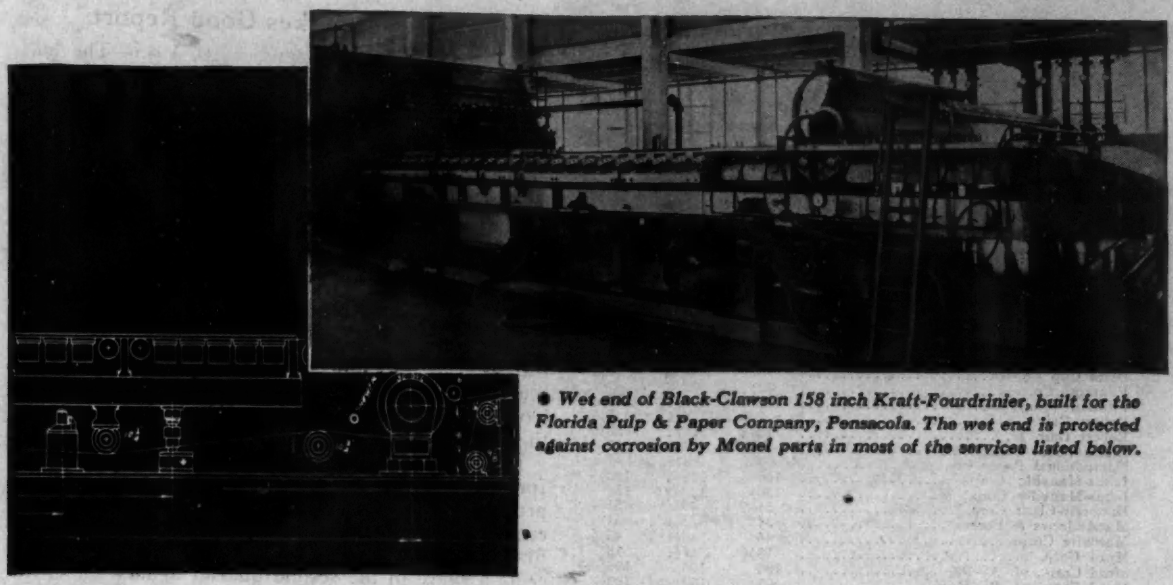
Dandy Rolls—An especially rigid and corrosion resistant roll body is built from Monel strip and wire with Monel wire cloth facing.

Suction Boxes—Boxes welded from ⅛" and ¼" Monel sheet are strong and of light weight.

Suction Box Covers—Monel covers have been used 2 years and more without resurfacing. Covers are made from ¼" thick full hard temper Monel strip.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK 5, N. Y.

Monel



● *Wet end of Black-Clawson 158 inch Kraft-Fourdrinier, built for the Florida Pulp & Paper Company, Pensacola. The wet end is protected against corrosion by Monel parts in most of the services listed below.*

Wire Return Rolls—Monel covers (⅛" thickness) over steel tubes. Roll covers are ground to finished diameter.

Fourdrinier Rails—.037" to .050" Monel sheet lined steel or cast iron rail construction.

Fourdrinier Side Beams—.037" to .050" Monel sheet lining over steel or cast iron rails.

Shaker Springs—"Z" nickel of full hard temper and age hardened is used for flat spring leaves of shakes with high stroke frequencies.

Save-All Trays and Pans—.062" to ⅛" Monel sheet is used generally for strong, durable, welded construction.

Cross Braces—.025" to .037" Monel is used for lining steel pipes.

Fourdrinier Brace Rods—Cold drawn Monel rods.

Remover Cross Drive Shafts—Cold drawn Monel rods.

Remover Beam Tracks—Gall resisting, high hardness cast "S" Monel for rollers or tracks; companion part is bronze.

Fourdrinier Remover Beams—.025" to .037" Monel sheet covered steel construction.

Shower Pipes & Nozzles—Seamless Monel tubing for pipes, and "R" Monel rod (200 BHN) for machined nozzles provide stiff and wear resisting showers.

Doctor Blades & Backs—Full hard Monel blades for bronze rolls. Monel sheet and angles for doctor back construction.

Belts & Other Fastenings—Monel fastenings are used safely in combination with bronze or copper fourdrinier parts.

CORROSION RESISTANCE OF MONEL TO PAPER STOCKS AND WHITE WATERS OF FOURDRINIERS*

Paper Stock	*Location of Monel Specimen*	*Stock Consistency*	*pH of Stock*	*Temp.*	*Corrosion Rate in Inch Penetration per Year*	*Remarks*
DE-INKED PAPER stock containing small amounts of SO_2, CL_2 and H_2SO_4	Immersed in headbox Middle West Mill.....	.....	4 to 4.5	.....	0.0001	Smooth surface, no pitting
NEWS PRINT 80% groundwood, 15% unbleached sulfite pulp	Immersed in headboxes 3 Northwestern Mills.....	2.8% to 3%	4.7 to 5.1	85° F. Average	0.0003 to 0.0014	Smooth surface, no pitting
KRAFT alum treated	Immersed in headboxes Northern Mill..... Southern Mill.....	....	6.5 to 7 4.5 to 6	95° F. Average	0.0001 0.0005	Smooth surface, no pitting
SULFITE bleached pulp	In save-all trough Middle West Mill.....	0.1%	6.8	140° F. Average	0.0008	Smooth surface, no pitting
BOND AND STATIONERY 100% linen and new cotton, rosin and alum sized	In feed line ahead of machine screen Eastern Mill.....	0.5%	6.5 to 7.3	84 to 130° F.	less than 0.0001	Smooth surface, no pitting
CIGARETTE PAPER	In white water box connected with suction boxes Southeastern Mill.....	.....	9.0 to 10.0	66 to 75° F.	less than 0.0001	Smooth surface, no pitting

**Tests conducted by paper mills in collaboration with Inco Development & Research Division. Test method in accordance with ASTM specification A 224-39T.*

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending September 8, 1545

STOCKS

	High	Low	Last
A. P. W.	7	6⅜	7
Armstrong Cork Co.	52¾	52	52¾
Celotex Corp.	18¼	17½	17¾
Celotex Corp., pf.	21	20	21
Certain-Teed Products Corp.	13¼	12¾	13
Certain-Teed Products Corp., pf.	168⅜	167	168½
Champion Paper & Fibre Co.	38	36¾	37
Congoleum Nairn Co.	36	33¼	34½
Container Corp. of America	29½	28½	29½
Continental-Diamond Fibre Co.	13¾	13	13⅜
Crown-Zellerbach Co.	25⅞	25	25⅞
Crown-Zellerbach Co., pf.	103	102⅝	103
Dixie Cup Co.	32½	31½	31⅜
Dixie Cup Co.—A	48½	48½	48½
Flintkote Co.	32¾	32	32⅛
Flintkote Co., pf.	109	107½	107½
Robert Gair	7¾	6¾	7⅛
Robert Gair, pf.	18¾	18¼	18½
International Paper Co.	30⅜	28¼	30½
International Paper Co., pf.	99¾	98¼	99¼
Johns-Manville Corp.,	130½	128¾	130½
Johns-Manville Corp., pf.	130½	129	130
Kimberly-Clark Corp.	51½	49¾	51½
MacAndrews & Forbes	34	33½	34
Masonite Corp.	46	44¼	45½
Mead Corp.	18¼	17¾	18
Mead Corp., pf. A—6%	106	106	106
Mead Corp., pf. B—5½%	103	102	103
National Container Corp.	16	15¾	15⅞
Paraffine Companies, Inc.	75	70	74½
Rayonier, Inc.	21	20	20¾
Rayonier, Inc., pf.	37⅜	37⅛	37⅜
Ruberoid Co.	41	40	41
Scott Paper Co.	56	53	54
Scott Paper Co., pf.	112	112	112
Sutherland Paper Co.	36	35½	36
Union Bag & Paper Corp.	21	20¼	20¼
United Paperboard Co.	8⅛	7⅜	8
U. S. Gypsum Co.	99⅞	97	99¾
U. S. Gypsum Co., pf.	190¼	190¼	190¼
West Virginia Pulp & Paper Co.	30¼	29¾	30
West Virginia Pulp & Paper Co., pf.	110	110	110

BONDS

Abitibi Pulp & Paper Co. 5s '53	102	101¾	101¾
International Paper Co. 6s '55	108½	108½	108½
International Paper Co. 5s '47	104½	104	104

New York Curb Exchange

High, Low and Last for Week Ending September 8, 1945

	High	Low	Last
Great Northern Paper Co.	38	37½	38
Hummel-Ross Fibre Corp.	10¼	9	10¼
St. Regis Paper Co.	8	7¾	7⅞
Taggart Corp.	6¼	6⅛	6¼

Imperial Paper Makes Report

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., September 10, 1945—The annual meeting of the Imperial Paper and Color Corporation was held last week at which officers and directors were chosen. Among the directors elected are A. F. Brown, Daniel K. Cowles, Louis Brown, George F. Mellen, George S. Knapp, Karl R. McBride, James S. Pearsall, J. Edward Singleton, Martin L. Wilmarth, Albert E. Emerson and William Rehe. Karl R. McBride was re-elected president. Other officers include Daniel M. Cowles and Martin Wilmarth, vice presidents; A. S. Frazier, secretary; H. J. Hall, assistant secretary; James H. Pearsall, treasurer, and J. J. Clark, assistant treasurer.

The annual report was submitted showing a net profit for the year ending June 30, 1945, amounted to $510,713.21 in comparison with $500,479.33 for the preceding year. Stockholders were paid dividend for the year to the amount of $364,143.78. The remainder of net earnings amounting to $146,569.43 was carried to surplus.

The strong financial position of the firm has been maintained as shown by the balance sheet, with cash on hand June 30, 1945, amounting to $1,515,782.34. The report also stated that 501 employes were serving in the armed forces.

Bathurst Makes Good Report

MONTREAL, Que., September 10, 1945—The half-yearly report of the Bathhurst Power and Paper Company, Bathurst, N. B., just released indicates a substantial improvement in the second quarter over the first.

Earnings for the six months ended June 30, 1945, before depreciation, depletion and income taxes, amounted to $587.572, as compared with $579,150 in the first six months of 1944. After such depreciation, the net profit was $176,002 in the first half of this year, equal to 44 cents per share of "A" stock. In the first half of 1944 the net profit was $165,211, or 41 cents a share, but the company points out that the net profits are not comparable "because in the current year the charges for depreciation and depletion have been reduced in accord with the decisions of the Income Tax Department."

By comparison with the previously issued report for the first quarter, indicated second quarter net profits showed an improvement, being equal to 25 cents per share, as compared with 18 cents in the first quarter. Last year the net profit equalled 25 cents a share in the second quarter against 16 in the first.

Current assets as of June 30, 1945, amounted to $5,186,752 and current liabilities to $928,221, indicating net working capital of $4,258,531, as compared with $4,329,847 on March 31. Current assets on June 30 included $942,440 in cash and marketable securities, against $1,197,587 on March 31.

While the second quarter earnings were slightly in excess of the dividend of 25 cents a share, those for the first quarter did not fully cover dividend requirements. However, it may be noted that last year the first six months showed 41 cents a share, whereas the second half improved to 54 cents, making a total of 95 cents a share earned for the year.

The "A" stock listed on the Montreal Stock Exchange moved up slightly on the publication of the earnings statement, and at the time of writing stands at 16¾. It has recently been held within a narrow range between 16 and 17 cents, although last month it touched 17½ and in June it touched 18, which is the high for 1945 to date.

Paraffine Nets $3.89

Paraffine Companies, Inc., and wholly owned domestic subsidaries for the year to June 30 reports a net profit of $1,948,481, equal to $3.89 a common share, compared with $2,015,604 or $4.03 a common share for previous fiscal year. Earnings include $712,719 dividends received from Fibreboard Products, Inc. compared with $1,083,725 received in dividends the year before. W. H. Lowe, president, reported record sales of $26,702,794, an increase of $1,210,733 or 4.75% over the preceding year, about equally divided between Government and commercial business. Net working capital on June 30, last, was $10,726,139 against $9,484,848 a year earlier.

Puget Sound Votes Dividends

At their meeting held September 6, 1945, the Board of Directors of Puget Sound Pulp & Timber Co. declared dividends payable to stockholders of record September 17, 1945, consisting of the regular quarterly dividend of 30 cents a share on the preferred stock, payable October 1, 1945, and a dividend of 25 cents a share on the common stock payable September 29, 1945.

WHEN IT COMES TO SURFACE...

Cyanamid Coating Chemicals

...DELIVER FINE RESULTS

For the production of fine coated papers, with smooth, level surfaces and uniform ink receptivity, Cyanamid offers you a full line of high quality coating chemicals.

CASEIN...

Our famous Dairyco brand of imported "Premium" grade casein is tested to high quality standards to provide a dependable source of supply.
Cyanamid's well-known ACCO* brands of domestic caseins are produced under close chemical control and supplied in the principal grades such as lactic, sulphuric, and muriatic.

CHINA CLAY...

English China clay is imported in grades suitable for loading and coating.
Domestic clays, air floated, water washed, and coating, are also available.

SATIN WHITE...

Satin White is produced by our own process in pulp form suitable for high grade coatings which are to have a high finish.

BLANC FIXÉ...

Blanc Fixé is produced as a pulp and a dry powder suitable for white coatings with a dull finish. It increases opacity.

FORMALDEHYDE 40%—U.S.P....

For use as a preservative and as a waterproofing agent in casein coatings.

CAL-MICRO...**

A high color, water ground, natural calcium carbonate filler with low casein requirement.

FOAM ELIMINATORS...

Various types for your specific requirement.

PAREZ* 608 RESIN...

Urea formaldehyde resin for making starch coatings washable.

CASEIN SOLVENTS...

Crystal Boro Phosphate	Borax	
Tri Sodium Phosphate	Ammonia	Soda Ash

We shall be glad to send you more detailed information on all chemicals and raw materials manufactured for the paper and pulp industry. Prompt deliveries can be made from convenient factories, warehouses, and sales offices.

WHEN PERFORMANCE COUNTS... CALL ON CYANAMID

American CYANAMID & Chemical Corporation

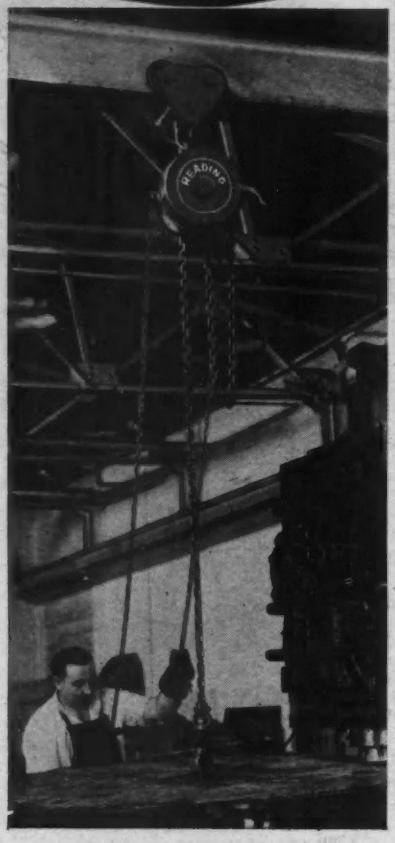
(A Unit of American Cyanamid Company)

**Trade-Mark *Reg. U. S. Pat. Off.

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Mo.; Azusa, Calif.; Seattle, Wash. In Canada: Dilkons Chemical Company, Ltd., Montreal and Toronto.

TO HOLD LOADS
Accurately
WITH SAFETY



The positive acting friction brake on the Reading Multiple Gear Chain Hoist makes possible accurate positioning of the work or load with complete safety.

The maple inserts in the brake wheel hold the load tightly against the friction disc till the load is to be moved. Lowering requires only that the operating chain be pulled in the down direction. The load lowers without slipping or speeding up.

Each Reading Multiple Gear Chain Hoist is so well built that it has a guaranteed overload capacity of 25% in every size from ¼ ton to 25 tons.

Investigate Reading Hoists for your materials handling problems. Consult your distributor or write us direct.

READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Sees Market in Brazil

MONTREAL, Que., September 3, 1945—Maurice Belanger, Canadian Commercial Secretary at Rio de Janeiro, reports that there are good prospects in Brazil for many paper items produced in Canada, particularly better grade book and writing papers and fruit wraps. In an article in the Commercial Intelligence Journal, published by the Department of Trade and Commerce in Ottawa, he further says that the present consumption of all paper in Brazil is less than ten pounds per person per annum, and is bound to increase considerably under more normal supply conditions. He notes that there are 41 paper producers in Brazil with a total aggregate production in 1944 of 139,613 metric tons. The equipment, he states, is mostly old and slow but extremely versatile and most of the mills produce a very wide range of paper, which would not be possible on more specialized equipment. The article also states:

"Most of the mills seem to be planning for increased production after the war and the purchase of more modern equipment. Net profits of all mills in the last few years have been extremely high and reserves have been built up to purchase new equipment when conditions permit.

"A new mill is under construction in the State of Parana to produce ground-wood, sulphite and kraft pulp as well as newsprint and fine cardboard stock. This mill is expected to have a daily capacity of 90 tons of unbleached and bleached sulphite, of which 40 tons will be used by the mill itself for its own production of newsprint and fine cardboard and 50 tons will be offered to other Brazilian mills."

Describes Powell Valves

A new booklet, "Powell Valves for Corrosion Resistance", which has just come off the press, briefly describes and illustrates a number of valves that are available in a wide selection of pure metals and special alloys for corrosion service. The various types of valves such as globe, angles, gates, checks, "Y's", needle, relief, flush bottom tank valves, etc., can be made in materials to control the flow of practically any known corrosion media. They are of special interest to the chemical and process industries, refineries, and all other plants where corrosion is encountered and where purity of end product must be maintained.

This booklet will be sent upon request, by the William Powell Company, Cincinnati, Ohio.

Pusey-Jones Appoints

The management of The Pusey and Jones Corporation announces the following changes in the activities of their personnel. George L. Coppage who has been appointed vice-president, joined the organization in 1907 and has advanced through many departments to his present position.

Ralph S. Johnston who has been appointed vice-president, joined the organization in 1911 and has progressed through the design and engineering departments to his present position.

Samuel M. Batton until recently chief engineer of the paper machinery division has returned to the organization and has been appointed technical adviser to sales and sales service.

Frank M. Sanger has been appointed chief engineer succeeding Mr. Bratton in that capacity. Mr. Sanger is well known in the field of paper making equipment, having been chief engineer of The Bagley and Sewall Company before joining the Wilmington organization in 1939.

Oakite Inhibits Slime

A new chemical development with lime solubilizing, fungistatic and detergent properties designed to inhibit slime growth and control formation of lime scale deposits in evaporative condensers and evaporative coolers is announced by Oakite Products, Inc., 48A Thames Street, New York 6, N. Y.

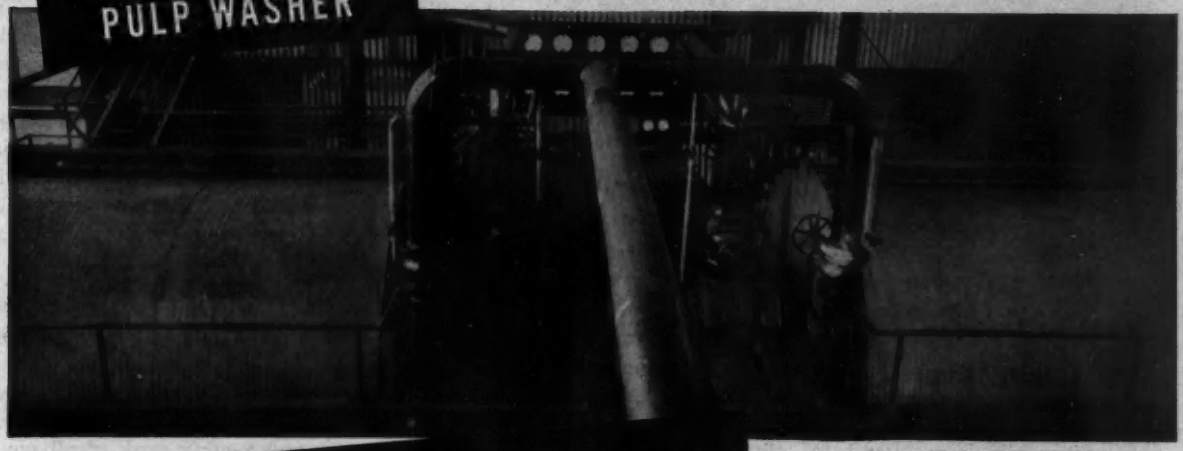
The material is a white powder, completely soluble, odorless and nontoxic. One ounce added to 10 gallons of make-up wate in sump is said to keep wateh sweet, prevent slime and hard lime scale from forming on coils, keep equipment clean and minimize need for maintenance. A free 4-page Special Service Report fully describing application and giving further details is available on request.

Fine Dust Collection

A new bulletin No. 101 issued by Aerotec Company of White Plains, N. Y., deals with the problem of efficient fine dust collection, particularly in the range 325 mesh screen or finer. Included are precipitating tests on various dusts in the industrial field, various powdered foods and chemicals. Also shown are the sizes available in Aerotev units from single tubes to 100,000 C.F.M.

A copy will gladly be sent on request to Thermix Engineering Company, First National Bank Building, Greenwich, Conn., project and sales engineers for the Aerotec company.

ONE SWENSON-NYMAN PULP WASHER DOES THE WORK OF TWO (and sometimes three) Ordinary Washers



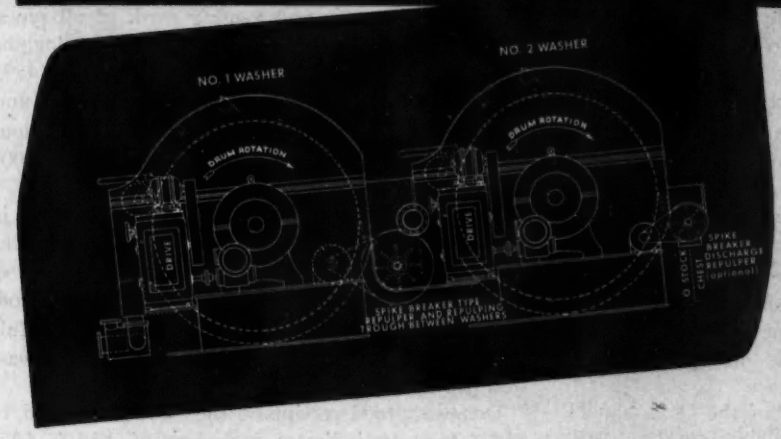


Diagram showing Swenson-Nyman two-drum installation for four-stage washing.

The double efficiency found in Swenson-Nyman Pulp Washers is obtained by two-stage washing on a single drum. Independently valved compartments each operate with a separate vacuum. The vacuum is distributed uniformly across the entire sheet at all times.

Other features: Washing area twice as large as the sheet forming area; backwashing entirely eliminated.

For kraft, sulfite, and soda pulp mills, Swenson-Nyman Pulp Washers are made in capacities up to 200 tons per 24 hours. Swenson engineers will be glad to determine the equipment best suited to the requirements of your mill after making a careful analysis. Write for Bulletin F-104 today.

OTHER SWENSON EQUIPMENT FOR ECONOMICAL PULP MILL OPERATION INCLUDES

- Black Liquor Evaporators
- Lime Sludge Filters
- Causticizing Equipment
- Digester Blow Condenser Heat Recovery Systems

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PAPER
TRADE JOURNAL
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W. L. Cook, Editor

CONVERSION IN THE PAPER INDUSTRY

Over fourteen important paper controls were revoked in the last two weeks in August. This is an initial step in the transition of the industry from war to peace. The WPB controls abolished are, however, those regulating the consumption of paper. Governmental regulations over the production of paper continue. This partial ending of wartime restrictions of the free manufacture of paper is creating confusion. There appears no practical advantages in the retention of Order M-241. The longer it is enforced the longer will it hamper the conversion problem.

Order M-241, the general conservation order on pulp and paper, as amended August 30, 1945, removes the prohibition against operating paper machines idle from May 1 to July 15, 1943. It reduces reserve production for all grades of paper 20%, except rag content fiber papers which continue at 35% reserve production. Control of condenser paper by the revocation of Appendix A, now is included in the 20% provision. The important L-120 order, simplification and standardization, continues in effect at this date. It is necessary to remove this restriction in the manufacture of paper before the industry is free to plan its post-war lines. No official statement is available how soon this wartime restriction will be completely removed. There appears to be no practical advantage why all controls should not be removed now.

The maximum price schedule of the OPA should also be revised to insure an equitable peacetime base for the production and distribution of paper and paper products. In any consideration of peacetime prices, the congressional proposal to establish a minimum wage of 65 cents an hour, to ultimately increase it to 75 cents an hour, must be included, if adopted. This proposition at once presents the problem, whether or not the industry can absorb these increases in production costs without a fair increase in selling prices. In view of the highly competitive nature of paper, it appears doubtful if the industry can earn a fair and just profit without moderately higher prices for its essential products.

This problem of increased costs is being currently commented upon by a number of economists and business writers. The general opinion appears to conclude that a sharp decline in corporate earnings is almost certain to occur for industry during the transition period. The low point in industrial activity is expected to come in the fall and following the recovery in civilian production. In an analysis of the earnings of six paper and pulp producers one report indicated that earnings were $2,477,870 in the first half of 1945, compared with $2,249,668 in the like period in 1944, and two newsprint manufacturing concerns earned $1,927,789 in the first half of 1945, compared with $1,953,851 in the first half of 1944.

An equitable price base is of first importance in the problem of attaining a high level of production and full employment as quickly as possible. The Office of Price Administration has been criticized by some legislators who have stated that that agency has not cooperated with the reconversion movement to insure a speedy return to peacetime production. It has been suggested that the Congress should inquire why the pricing agency should not use its powers more fully to aid in the reconversion of all industry.

PULPWOOD RECEIPTS UNCERTAIN

The pulpwood supply situation is rendered uncertain by the withdrawal of some 10,000 war prisoners from the woods, largely in the South where about 50% of forestry and logging operations has been done by such labor. Employment of prisoners of war assigned to forestry and logging work of all types, including both pulpwood and saw-timber logging operations, for private employers increased to 459,000 man-days throughout the United States in June, an increase of 30,000 man-days over the previous month. In the South such employment rose to 12,000 man-days in June over May.

Total receipts of pulpwood by domestic mills in July were 1,580,423 rough cords, compared with 1,592,800 cords in June, 1945, and 1,561,460 cords in July, 1944, the War production Board's Forest Products Bureau has announced. The decrease in July receipts was less than one per cent and the increase over July, 1944 was 1.2%.

Domestic wood receipts in the Southern region, of 618,007 cords, indicates a decline of 12.1% from July, 1944. This was attributed to the wet weather. Receipts in the first seven months totaled 4,263,736 cords, an increase of 150,746 cords, or 4% over receipts in the same period in 1944.

Receipts in July in the Lake States totaled 134,923 cords, an increase of 6.6% over July, 1944. Seven months' receipts of 1,194,866 cords declined 285,801 cords or 19% from the like period in 1944.

In the Appalachian area receipts of domestic wood totaled 128,282 cords in July, an increase of 2,744 cords or 2% above July, 1944. In the Northeast July receipts aggregated 253,477 cords, a gain of 21,945 cords or 9% over July, 1944. In the Pacific Northwest July receipts totaled 253,523 cords, a gain of 35,025 cords or 14% over July, 1944. Inventories of pulpwood at the end of July indicated declines of from 16 to 36% below last year in all regions except in the Northeast, where an increase of 0.16 was reported. Total U. S. receipts (including imports) for the seven months were 9,965,987 cords, a decrease of 0.2% below the same period in 1944.

Reports on Canadian Newsprint

MONTREAL, Que., September 10, 1945—Details of exports of Canadian newsprint to various countries besides the United States have now been made available for February and the first two months of the present year. These figures have lagged six months behind date in conformity with censorship regulations, but they are interesting as showing the extent to which the supply available for export has been allotted to various South American and overseas markets.

In February the newsprint passing Canadian customs points, destined for countries other than the United States, amounted to 35,195 tons, as compared with 34,134 tons in the like month of last year. Exports to the United States totaled 175,888 tons as compared with 170,425.

For the two months the "overseas" total was 65,009 tons against 58,621 tons in the first two months of 1944, and the total going to the United States was 348,879 tons against 345,504. The biggest "overseas" total went to Australia.

Following are Canadian exports of newsprint (in short tons for the first two months.

	Two Months	
	1945	1944
United Kingdom	6,978	5,776
Eire	1,880	104
Continental Europe	3,050	1,197
Mediterranean Area	374	478
Egypt	1,037	1,865
British South Africa	2,314	2,781
Other Africa	844	922
Br. India, Ceylon and Burma	3,595	2,585
Australia	17,174	8,936
New Zealand	4,812	3,318
Argentina	4,943	9,620
Brazil	6,682	7,527
Uruguay	1,076	2,001
Other South America	3,398	3,460
Mexico	2,128	2,929
Cuba	718	1,854
British West Indies	882	580
Other Caribbean Area	1,225	1,437
Others	1,899	1,351
	65,009	58,621
United States	348,879	345,504
Total	413,888	404,125

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
July 28	93.4	July 29	91.3
Aug. 4	93.6	Aug. 5	89.8
Aug. 11	93.0	Aug. 12	91.2
Aug. 18	67.8	Aug. 19	90.4
Aug. 25	95.4	Aug. 26	92.2
Sept. 1	95.2	Sept. 2	89.4

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	*81.6*					

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	69.0	78.9	86.7	94.2	93.2	88.2	87.9	*88.0*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

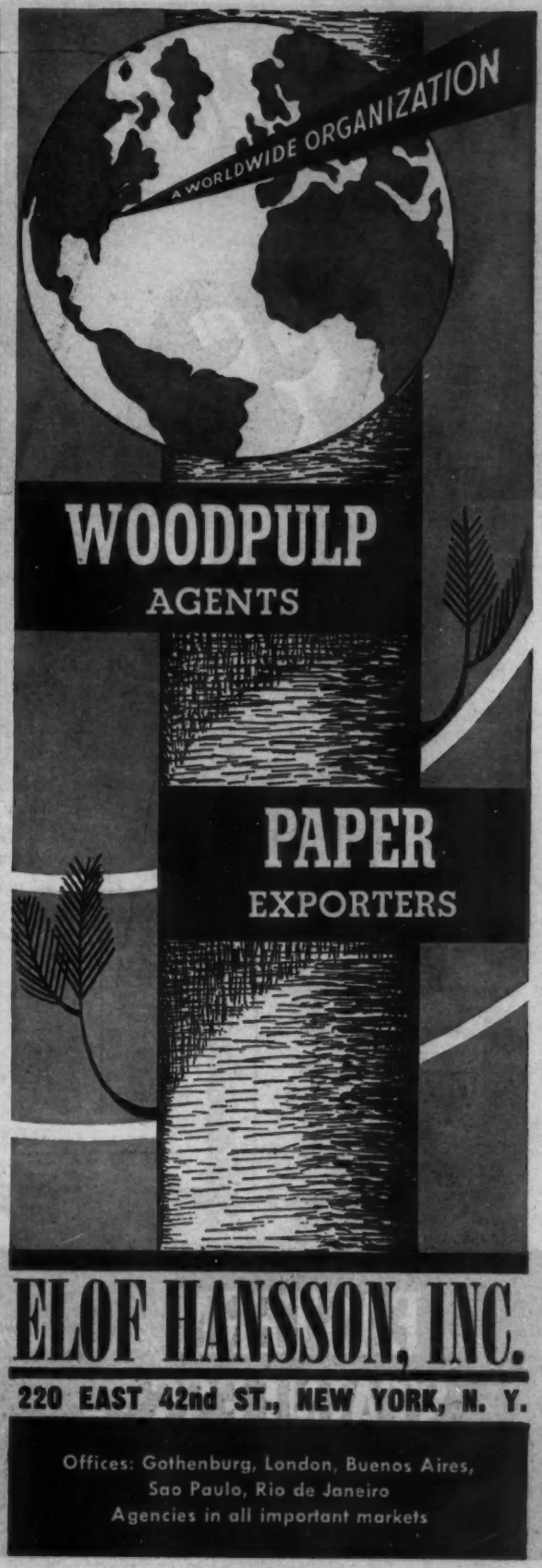
*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
July 28	95	July 29	96
Aug. 4	94	Aug. 5	96
Aug. 11	94	Aug. 12	96
Aug. 18	67	Aug. 19	95
Aug. 25	99	Aug. 26	94
Sept. 1	97	Sept. 2	94

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	86	90					

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



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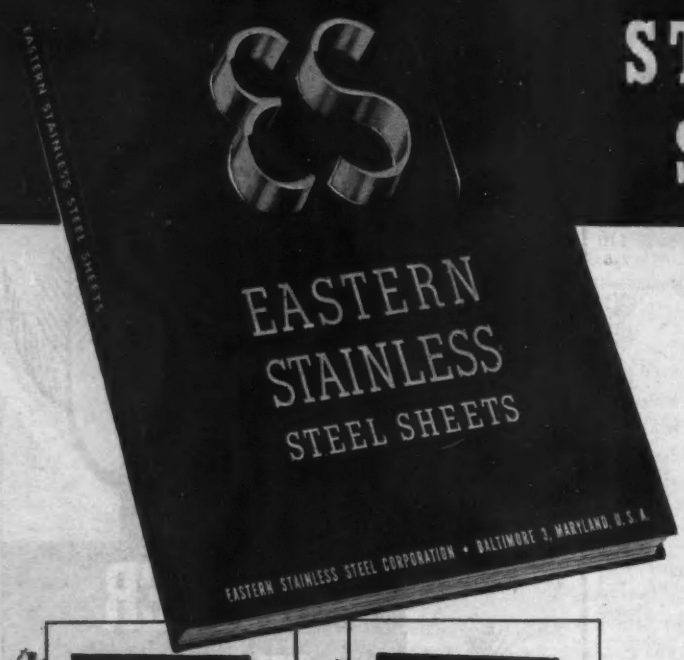
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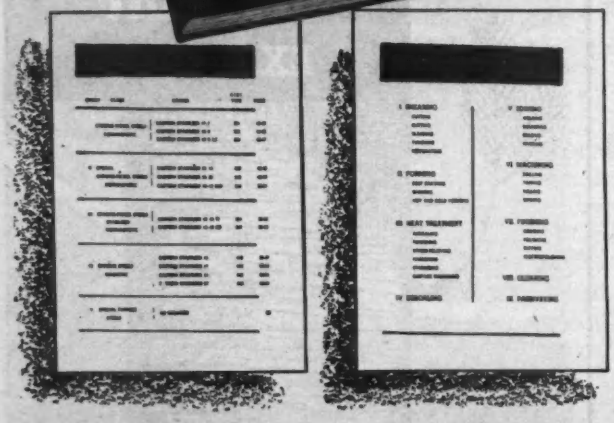

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The "Fading" of Groundwood by Light*

II. The Physical Mechanism of Fading

By Philip Nolan[1], J. A. Van den Akker[1] and W. A. Wink[2]

Abstract

In a physical study of the "fading" of groundwood by light, it was shown that such papers fade at a somewhat faster rate in the presence of atmospheric oxygen than in its absence. Other things being equal, the papers fade more rapidly at high humidities and at high temperatures. The absorption of light by the lignin in groundwood is responsible for initiating at least a portion of the reactions which give rise to the characteristic yellowing of the color of groundwood upon exposure to light. The greatest fading per unit intensity of light occurs at shorter wavelengths (the maximum effect is at 313.2 mmu). There are at least two photochemical reactions in the discoloration of groundwood. First, there is the so-called bleaching action produced by radiation of wavelengths longer than 385 mmu, with a maximum value of the increase in reflectance of about 2 points in normal brightness. Second, there is a normal dulling and yellowing of the groundwood sheet which results from the action of light of wavelengths shorter than 385 mmu.

This paper includes a discussion of experiments carried out to determine the part played by such conditions as atmospheric oxygen, humidity, temperature, etc., on the ultraviolet light fading of groundwood handsheets. In carrying out the tests, portions of the handsheets were placed in a quartz flask which could be evacuated by means of a vacuum pump and the samples were exposed to the light of a Hanovia mercury arc *(1)*, the intensity of which was controlled by means of photoelectric equipment. A General Electric recording spectrophotometer *(2)* and a General Electric reflection meter *(3)* were used for evaluating the fading.

The objective specification of color of groundwood is best given by reflectance measurements. *Reflectance* is defined as the ratio of the amount of light reflected from the sample to the amount of light reflected from the magnesium oxide standard, for the same conditions of illuminating and viewing. A complete description of the color of the sample is given when a curve is plotted showing the reflectance of the sample *versus* wavelength over the visible spectrum. This relationship is known as the *spectral reflectance curve.* The color change taking place in a faded groundwood sheet is measured by colorimetric calculations based on the spectral reflectance curves of the faded and unfaded samples of the groundwood. The General Electric recording spectrophotometer automatically records the spectral reflectance curve.

In many cases a difference in the reflectance between the unfaded sample and the faded sample for a particular wavelength range of the spectrum is an adequate measure of the amount of fading. The General Electric reflection meter is designed to perform such a measurement and the particular range of wavelengths chosen for the "brightness" readings given in this report lies between 400 and 500 millimicrons (mmu) with the average or effective wavelength of 457 mmu *(4)*. (The General Electric reflection meter is provided with filters other than the blue filter employed in the evaluation of brightness, so that measurements can be made for nine ranges of wavelengths between the extreme violet and the red end of the visible spectrum.)

Control of Ultraviolet Exposures

Strips of groundwood handsheets were faded in the neck of a quartz flask which was mounted directly in the beam of the mercury arc in such a manner that the sample was 19 cm. from the "burner" of the arc. The arc was always turned on 0.5 hour before fading exposures were started, and its intensity was checked by means of a blocking-layer photocell connected directly to a Leeds and Northrup galvanometer. In order to control the ultraviolet intensity of the arc, a piece of lens paper which had been dipped in a dilute solution of Uranine B dye (Heller and Merz), was placed with an ultraviolet filter over the sensitive surface of the photocell.

Brightness measurements were made before and after fading under the arc. Recording spectrophotometer curves were run on all faded samples but, because of the uniformity of the curves obtained on blank groundwood sheets, only a few curves were taken for unfaded samples.

Preliminary fadings in air were made to determine the reproducibility to be expected and the fading time required to give an appreciable change in brightness values. The data for these fading tests are given in Table I. Sample d was faded 6 weeks after Samples a, b, and c.

TABLE I.—REPRODUCIBILITY OF BRIGHTNESS CHANGES DUE TO FADING

Sample	Original Blank	1 Hour	2 Hours	3 Hours
a	59.7	53.1	50.4	48.5
b	59.8	53.6		
c	59.3	52.7		
d	60.4	53.3	50.3	

* Presented by title at the Annual Meeting of the Technical Association of The Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945. This work was carried out for the Groundwood Paper Manufacturers Association and is published with their permission.

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A number of experiments were then made to determine the relative fading of groundwood handsheets under various conditions.

Presentation of Results and Discussion

The Role of Atmospheric Oxygen in Fading

The first tests were run to determine what part, if any, atmospheric oxygen plays in the fading. Five exposures were made:

1. Groundwood paper was exposed to the arc in an open flask under the conditions described.
2. A second sample was exposed similarly but in a flowing atmosphere of oxygen.
3. In the third experiment, nitrogen was used in place of oxygen.
4. Two separate exposures were made of strips set in the same quartz flask and evacuated; the first was faded for 2 hours after 16 hours' evacuation, the second after 49.5 hours' evacuation.

The changes in brightness after exposure are listed in the last column of Table II.

TABLE II.—RELATIVE EFFECT ON THE BRIGHTNESS OF GROUNDWOOD HANDSHEETS WHEN FADED IN AIR, OXYGEN, NITROGEN, AND IN A VACUUM

Fading Conditions	Blank, %	Time of Fading, 2 Hours, %	Drop in Brightness After 2 Hours' Fading
Air	60.4	50.3	10.1
Oxygen	61.0	52.0	9.0
Nitrogen	59.5	52.5	7.0
Vacuum (16 hr.)	60.6	53.8	6.8
Vacuum (49.5 hr.)	60.7	53.1	7.6

It should be noted that the difference in brightness drop between the sample aged in oxygen and that aged in air must be considered as being within the limits of experimental error. It is evident that the atmospheric oxygen plays some part in fading, although the effect is not of sole importance, for the drop in brightness when the groundwood paper is aged in nitrogen or in a vacuum is not much less than when the same paper is aged in either air or oxygen. It is probable that the atmosphere supplies more oxygen than is required to bring about the maximum fading for a given quantity of light.

The Role of Temperature and Humidity in Fading

A second series of experiments was then arranged to determine the effect of variations in humidity and in temperature on the rate of discoloration of groundwood by ultraviolet light.

To study the effect of humidity, a sample of a groundwood handsheet was faded in air carrying a high moisture content. A second sample was faded after drying over phosphorus pentoxide for 22 hours. A control sheet was faded in air containing the normal atmospheric moisture.

The effect of temperature was determined by fading a sample for 2 hours at a temperature of 100° C., the temperature being read immediately under the sample. For comparison, a blank was run at room temperature.

The results of the humidity and temperature tests are listed in Table III.

TABLE III.—RELATIVE EFFECT ON THE BRIGHTNESS OF GROUNDWOOD HANDSHEETS WHEN FADED IN AIR UNDER DIFFERENT CONDITIONS OF TEMPERATURE AND HUMIDITY

Fading Conditions	Blank, %	Fading for 2 Hours, %	Drop in Brightness After 2 Hours' Fading
Atmospheric humidity	60.4	50.3	10.1
High humidity	60.5	49.6	10.9
Dry	59.7	51.7	8.0
Room temperature	60.4	50.3	10.1
100° C.	59.1	45.1	14.0

It seems probable that the moisture present in the paper influences to some extent the rate of fading of the groundwood handsheets. The smallest drop in brightness is noted with the sample at the lowest humidity, whereas the greatest drop is found with the sample at the highest humidity. The effect of variations in humidity is only of secondary importance, for even the dry sample lost 8 points in brightness.

The effect of temperature on increasing the fading rate is somewhat more marked. Whereas the brightness of the sample exposed at room temperature dropped 10.1 points, that of the sample faded at 100° C. dropped 14 points. The same groundwood maintained at 100° C. in the dark for 2 hours dropped only 0.5 point in brightness. It would appear that the primary reactions of fading are very greatly accelerated by an elevation of the temperature. Heat in the absence of light plays very little part in the color change.

Spectral Sensitivity Studies

It was of interest to observe which particular wavelength ranges in the ultraviolet spectrum were causing the fading.

This was first determined in an exploratory experiment as follows: a groundwood handsheet was placed in the plate holder of a Bausch and Lomb medium quartz spectrograph and exposed to the dispersed radiation of the Hanovia arc for 75 hours, using a 1-mm. slit. At the positions corresponding to the wavelengths which cause fading, there should be narrow, dark bands on the paper. A very slightly discolored spectrum was observed on the handsheets at wavelengths of 365, 334.2, 313.2, and 302.2 mmu, the discoloration being most marked at a wavelength of 313.2 mmu. (It is of practical interest to note that light of wavelength shorter than 313.2 mmu is present in the summer sun.)

In order to determine roughly the energy available, a strip of the handsheet was placed over the slit of the spectrograph and exposed to the total radiation of the arc for 30 hours, under which condition a discoloration was produced only slightly greater than that in the dispersed spectrum at 313.2 mmu.

Following these preliminary experiments, a rather extended study of the photochemical nature of fading was carried on. In the normal studies of photochemical processes, the following data are usually interpreted to have significance in terms of the nature of the chemical reaction:

1. Spectral sensitivity of the reaction—i.e., the variation of the fading per unit light intensity for different wavelengths of light illuminating the sample.
2. The variation of the rate of reaction with the intensity of the absorbed light.
3. The variation of the rate of reaction with variations of the temperature of the radiated substances.

The bases for interpreting these data in terms of the nature of the chemical reaction vary for individual problems. The principal basic assumption which has led to best results in interpreting photochemical data is that the photochemical reaction consists of essentially two parts: first, the primary process, in which the rate of reaction is directly proportional to the amount of light absorbed by the reacting component or components and, second, the secondary processes, which are generally chemical reactions proceeding from the reaction products of the primary process. It is with regard to the primary process that the spectral sensitivity of the reaction can often be of value in determining the mechanism of the reac-

tion. The secondary reactions plus the primary reaction often result in a chain reaction, in which the over-all rate of the photochemical reaction can be controlled by modifying the nature of one of the intermediate steps in the chain reaction.

The preliminary tests indicate that, when groundwood is faded by exposure to a mercury arc lamp, the wavelength ranges of the spectrum of mercury most effective in producing the darkening of color are those below 400 mmu.

For the purposes of further study of the complex photochemical reactions that occur in groundwood, it is important that information should be acquired on the relative effectiveness of various wavelengths of ultraviolet and visible light in producing fading. To obtain quantitative information, the radiation must be monochromatic, and it is necessary to measure not only the exposure time but also the intensity of the radiation to which the sample is exposed. It is then possible to obtain the relative energy of various wavelengths of the ultraviolet and visible spectrums which will produce the same drop in brightness (in the data presented later the same drop in reflectance as determined by the General Electric recording spectrophotometer at 460 mmu.)

To obtain such data, the following experimental arrangement was used: light from a Mazda H-3 mercury arc which had been removed from its glass envelope was condensed on the slit of a Bausch and Lomb quartz monochromatic illuminator. Monochromatic light from the latter device was focused by means of a quartz lens upon the receiver of a thermopile which, in conjunction with a sensitive galvanometer, enabled accurate measurement of the intensity of the radiation. The mercury arc was operated with a constant voltage regulator to ensure constancy of output and freedom from error due to fluctuation in voltage of the 115-volt mains.

With the monochromator set at a definite wavelength, an intensity measurement was made. Following this, a sample of groundwood handsheet was placed over the window of the thermopile. After an exposure time sufficient to produce approximately the required drop in reflectance, the intensity of the radiation was again measured. The product of intensity and exposure time is a proportional measure of energy. Using data on the relationship between drop in reflectance and energy of radiation for a certain wavelength, it was then possible, for the wavelengths in question, to obtain a fairly exact value of the energy required to produce the predetermined drop in reflectance.

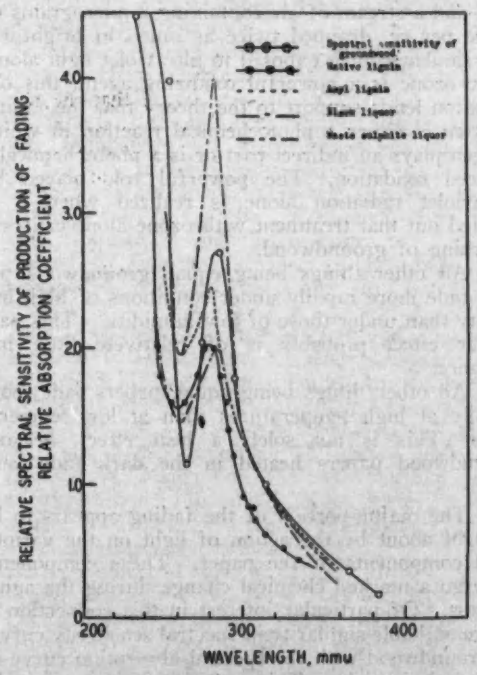


Fig. 1

Comparison of Spectral Sensitivity of Fading of Groundwood and Spectral Absorption Curves of Lignin Compounds

The spectral sensitivity curve so obtained is given in Fig. 1. This curve exhibits a remarkable similarity in shape to the spectral absorption curves of various lignin derivatives. However, there is no correspondence in shape with the absorption curves (determined by ultraviolet reflectance measurements) for the groundwood handsheet; this is probably attributable to the very low reflectance of groundwood in the ultraviolet. It should be noted that, in addition to a general similarity in shape of the spectral sensitivity curve with the spectral absorption curve of lignin derivatives, there is very close agreement between the wavelengths for both the maximum and minimum which were observed in this curve. *This agreement between the shapes of the curves indicates quite definitely that the absorption of light by lignin in groundwood is responsible for initiating at least a portion of the reactions that give rise to the characteristic yellowing of the color of exposed groundwood.* This agreement in shape of the two types of curves is not sufficient in itself to indicate that the lignin *per se* is suffering a permanent change in chemical composition produced by the action of light, because it does not rule out the possibility that the lignin is acting as a catalyst for the photochemical reaction; however, both the increase in alkali solubility of the faded sheet and the temperature variation of the rate of reaction indicate that the lignin in itself must be modified in some manner by the action of light, and associated with this modification is the increase of the absorption coefficient in the visible spectrum and the consequent yellowing of the sheet.

There is really very little published work on the detailed study of the mechanism of photochemical reactions of solids and it is only within the last few years that some success has been had in associating the reaction product of a chemical reaction with the original chromophoric group present in the molecule. It has been possible in certain cases to show that a definite chromophoric group which is responsible for the ultraviolet absorption initiating the reaction has undergone a change, giving rise to the observed reaction product.

In deriving the spectral sensitivity curve from the experimental data, it was assumed that the drop in reflectance of the faded handsheet at 460 mmu. wavelength is a good measure of the amount of reaction product produced during fading. It is to be emphasized that during the course of the work, starting from the original comparison between the fading of groundwood in sunlight and under the Fade-Ometer, it was observed that there is a distinct difference in the shapes of the spectral reflectance curves of faded groundwood for early times of fading by these two sources of light. It is thought that this difference in shape indicates that there are two reactions involved.

It is of interest to note that, in general, when a sample is illuminated by light of wavelength shorter

than 350 mmu, there is a decrease in the reflectance of the faded sample for all wavelengths from 400 to 700 mmu. For wavelengths of fading light longer than 350 mmu, the sample experiences practically no change in reflectance at 400 mmu, but a decrease in reflectance is observed for wavelengths greater than 450 mmu. In addition to these observations for monochromatic light, it was thought desirable to observe the change in reflectance of illuminated handsheets when the wavelengths of the radiations were greater than 385 mmu. Two series of measurements were carried out in which the light from a powerful tungsten filament projection lamp, after passing through a filter, was focused on the groundwood sheet. In the first case the wavelengths passed by the filter were longer than 480 mmu, whereas in the second case the wavelengths passed by the filter were greater than 385 mmu. For the case of radiation of wavelengths longer than 480 mmu, it was observed that the reflectance of the groundwood sheet *increased* at all wavelengths in the visible spectrum by as much as 2% after irradiating the sample for approximately 100 hours. In the case of the filtered light of wavelengths longer than 385 mmu, this brightening of the groundwood was observed to occur during the first 18 hours of the radiation, and subsequent to that time the reflectance decreased in an analogous manner to the ordinary decrease in reflectance accompanying radiations shorter than 385 mmu. These observations indicate very definitely that there are at least two photochemical reactions in the discoloration of groundwood. First, there is a slight, so-called bleaching action caused by radiations longer than about 385 mmu, with a maximum value of the increase in reflectance of about 2 points in normal brightness. Second, there is the normal dulling and yellowing of the groundwood sheet.

At the present time it is not possible to say whether the reactions initiated by the absorption of light at an intermediary wavelength (e.g., at 365 mmu) give rise to a third type of reaction or to the simultaneous excitation of the two principal types of reactions, with a different rate law holding for each. It is important to mention also an observation made during the first part of the general program of this study. During the 24-hour period after illumination is removed, there is an increase in the spectral reflectance curves of the faded handsheets by as much as 2 points for wavelengths greater than 650 mmu. The question immediately arises as to whether this reversion is an indication of a reversible reaction taking place during the normal course of the fading process.

To test the dependence of reaction rate on light intensity, the reciprocity law was investigated for groundwood. Where this law holds, the total energy of the light is the predominating factor producing a given phototropic effect and the effect of the light energy is independent of light intensity; that is, if the intensity of the light is decreased by a factor of ten, the exposure time should be increased by a factor of ten in order to produce the same effect. The results of measurements made to test this point indicate that the reciprocity law is valid under certain conditions and that, in any case, it is approximately true.

On considering the mechanism of the photochemical reactions in the fading process, the question of the effect of the presence of oxygen was considered earlier. In reviewing the data obtained in the preliminary experiments, it is apparent that fading was not dependent on oxygen alone, for considerable fading occurs in samples exposed in a vacuum.

However, in later work, the reflectance at 457 mmu of a groundwood handsheet dropped 2.7 points on exposure to the full radiation from a Hanovia mercury arc for a period of 1.5 hours, while under the same conditions a handsheet exposed to ultraviolet light and a stream of air containing 8 micrograms of ozone per cc. exhibited a drop in reflectance of 5.3 points—that is, twice the drop experienced by the sample exposed to ultraviolet light alone. Since ozone is a powerful oxidizing agent, this observation lends support to the theory that the fading reaction is either a photochemical reaction in which oxygen plays an indirect part or is a photochemically induced oxidation. The powerful role played by ultraviolet radiation is realized when it is pointed out that treatment with ozone causes a *bleaching* of the groundwood. It is possible that the bleaching reaction is separate and distinct from the fading reaction and might be closely associated with the bleaching reaction brought about by irradiation of groundwood with light of wavelengths longer than 385 mmu.

Summary

The experiments described above indicate that the reactions involved in the fading of groundwood are very complex. The following conditions all influence the rate of fading of groundwood by light:

1. Groundwood paper fades at a somewhat faster rate in the presence of atmospheric oxygen than in its absence. That the presence of oxygen is not all-important is indicated by the fact that the rate of fading of groundwood in a vacuum is very appreciable (which may have been due in part to the absorption of traces of oxygen by the fibers and which is not removed by the vacuum). Somewhat significant is the discovery that a groundwood sheet will fade at a much more rapid rate when exposed to ultraviolet light in a stream of ozonized air. Under parallel conditions the handsheet exposed to both ultraviolet light and a stream of air containing 8 micrograms of ozone per cc. dropped twice as much in brightness as a similar sample exposed to ultraviolet light alone. Since ozone is a powerful oxidizing agent, this observation lends support to the theory that the fading reaction is either a photochemical reaction in which oxygen plays an indirect part or is a photochemically induced oxidation. The powerful role played by ultraviolet radiation alone is realized when it is pointed out that treatment with ozone alone causes a bleaching of groundwood.

2. All other things being equal, groundwood papers fade more rapidly under conditions of high humidity than under those of low humidity. This particular effect probably is of relatively little importance.

3. All other things being equal, papers fade more rapidly at high temperatures than at low temperatures. This is not solely a heat effect, because groundwood papers heated in the dark fade very little.

4. The major portion of the fading appears to be brought about by the action of light on the various solid components of the paper. These components undergo a marked chemical change during the aging process. Of particular interest in this connection is the remarkable similarity in spectral sensitivity curves of groundwood with the spectral absorption curve of lignin derivatives. This agreement between the shapes of the curves indicates quite definitely that the

absorption of light by the lignin in groundwood is responsible for initiating at least a portion of the reactions which give rise to the characteristic yellowing of the color of exposed groundwood.

5. At least four lines of the low pressure mercury arc in the unfiltered ultraviolet appear to play an important part in the fading reaction. These are: 365, 334.2, 313.2, and 302.2 mmu. The most marked change is apparently brought about by light at a wavelength of 313.2 mmu. The greatest fading *per unit intensity of light* occurs at shorter wavelengths, and the maximum effect at 313.2 mmu is due to the larger intensity of this line in the spectrum of light from the bare mercury arc employed.

6. Observations made on the action of light of various wavelengths on the change in color of the groundwood sheet suggest very definitely that there are at least two photochemical reactions in the discoloration of groundwood. First, there is the so-called bleaching action produced by radiation of wavelengths longer than 385 mmu, with a maximum value of the increase in reflectance of about 2 points in normal brightness. Second, there is a normal dulling and yellowing of the groundwood sheet which results from the action of light of wavelengths shorter than 385 mmu as indicated under 5. At the present time, it cannot be said whether or not the reactions initiated by the absorption of light at some intermediary wavelength give rise to a third type of reaction or to the simultaneous excitation of the two principal types of reactions with a different rate law holding for each.

Literature Cited

1. Hanovia Chemical and Manufacturing Co., Type BU (D.C. arc, 7.5 amp.).
2. Michaelson, J. L., *J. Optical Soc. Am.* 28. 365 1938).
3. Michaelson, J. L., *Gen. Elec. Rev.* 38: 194-196 (1935).
4. Van den Akker, J. A., Nolan, Philip, and Wink, Willmer A., *Paper Trade J.* 114, No. 5: 34-40 (Jan. 29, 1942).

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp & Paper Industry has elected the following to membership:

Jacob L. Barowsky, Treasurer, Adell Chemical Company, Holyoke, Massachusetts, a 1915 graduate of Harvard College.

Gordon L. Benson, Chief Chemist, Nashua River Paper Company, East Pepperell, Massachusetts, a 1933 graduate of Clark University.

R. Seward Hagaman, Research Director, Defender Photo Supply Co., Inc., Rochester, New York, a 1917 graduate of Colgate University.

Alfred E. Johnson, Member of Research Staff, Consolidated Machine Tool Corp., Rochester, New York.

John W. Kraus, Engineer in Charge of Packaging, Thompson Products, Inc., Cleveland, Ohio, a 1941 graduate of Massachusetts Institute of Technology.

George E. Lockwood, President, Lockwood Trade Journal Co., Inc., 15 West 47th St., New York 19, New York, a 1935 graduate of Cornell University.

Herbert W. Mackinney, Research Chemist, Bakelite Corporation, Bloomfield, New Jersey, a 1928 graduate of Swiss Institute of Technology, and a 1935 graduate of McGill University.

Alex J. Pagel, President, Pagel, Horton & Co., Inc., 347 Madison Ave., New York 17, New York, a 1911 graduate of the University of Pennsylvania.

George W. Sawyer, Technical Supervisor, Ahdawagam Paper Products Co., Wisconsin Rapids, Wisconsin, a 1929 graduate of the University of Maine.

TAPPI Noes

Tom O'Flynn, formerly of the Puerto Rico Pulp and Paper Corporation, is now superintendent of Secion de Fabrica de Papel Empaques de Carton Titan, S. A., Monterrey, N. L., Mexico.

R. M. Pickens is now sales director for Rayonier, Inc., 122 East 42nd Street New York, N. Y.

W. S. Lucey is vice president of Rayonier, Inc., New York City.

W. E. Breitenbach is now vice president and resident manager of Rayonier, Inc., Port Angeles, Wash.

James T. Sheehy is now resident manager of Rayonier, Inc., Fernandina, Fla.

L. Hahn, formerly of Orient Paper Mills Ltd., Orissa, India, is now chemist for Whakatane Paper Mills, Ltd., Whakatane, New Zealand.

Joseph Edwards is now assistant manager of Price Bros. & Co., Ltd., Kenogami, P. Q.

T 469 sm-45: Because of several constructive criticisms the TAPPI Paper Testing Committee has withdrawn suggested method T 469 sm-45, Flexural Resistance and Deflection of Fiberboard. The method is under consideration for revision and reissue.

Members of the TAPPI Delaware Valley Section executive, program and membership committees met at the Engineers Club, Philadelphia, Pa., on Friday evening, September 7th. Those present included A. L. M. Bixler, Chairman, Riegel Paper Corp., L. K. Burnett, Curtis Publishing Co., Waldemar Jacobson, National Aniline Division, Kingdon Watt Curtis Paper Co., E. J. Albert, Thwing-Albert Instrument Co., J. P. Weidner, Container Corporation of America, Miss L. V. Hans and J. C. Dieffenderfer, Hercules Powder Co., John Macadam, National Vulcanized Fibre Co., Harry Hulmes, Jr., U. S. Rubber Co., Miss Louise McGrath, Booth Chemical Co., C. A. Shubert, Dill & Collins, Inc., and R. G. Macdonald, Secretary of TAPPI. Details for all meetings of the coming season were worked out. The first meeting will be on October 5th at the Engineers Club, Spruce Street, Philadelphia at 6:30 p.m. There will be a discussion of the utilization of waste paper during the war and the showing of the Navy Department film on waste paper. Meeting will be held at the Club on the first Friday of each month.

George A. Balko of the Mead Corporation is now in Europe with the Quartermaster Corps as a temporary Colonel to assist in the reestablishment of continental European paper mills.

Benton R. Cancell is now located at 3 Wakeman Place, Larchmont, N. Y.

Gosta P. Genberg of the Swedish Pulp Company, Stockholm, Sweden, is now visiting the United States.

H. P. Somerset and J. J. Graham of the Associated Pulp and Paper Mills, Ltd., of Australia are visiting in this country.

Gustav Edling, vice president of the Swedish Steam Boiler Users Association is visiting kraft and soda pulp mills in America.

Correction: TAPPI Standard T 205 m-42. Change Item 9 under Apparatus to read "A quantity of sheets of standard blotting paper, 8 inches square, 0.0195-0.0205 inches thick, weighing 240-260 grams per sq. meter and having an absorbency of not less than 9 nor more than 20 seconds when tested according to TAPPI Standard T 432 m. In the footnote at the bottom of the second column on the first page, change commercial basis weight to 80 pounds, 19x 24-500.

Sieve Analysis of Pulpwood Chips

TAPPI Suggested Method T 16 sm-45

This method measures the amounts of several different sized aggregates in pulpwood chips by means of sieves. It is useful in controlling various operations in the preparation of chips, such as determining when to sharpen chipper knives, and the maintaining of efficient operation of rechippers, chip breakers, and chip screens, thereby maintaining the uniformity of size distribution necessary for satisfactory digestion.

Apparatus

1. *Sieves.* Approximately square sieves, having not less than 3 square feet of effective screening area and of such depth that, when set in the shaking apparatus, the screen surfaces shall not be less than 2¾ inches apart. The screening surface of each sieve shall be a round-hole perforated plate conforming to the Standard Specifications for Sieves for Testing Purposes of the American Society for Testing Materials (*1*). The smoother side of the plates shall face upward.

The A.S.T.M. sieve specifications applicable to this method are as follows:

(*a*) *Thickness of plates.* Plates with 100 square inches or more screening area, perforated with $\frac{1}{16}$- to ⅛-inch diameter openings, shall not be less than 0.049 nor more than 0.066 inch in thickness; plates perforated with ¼- to 2½-inch diameter openings shall not be less than 0.060 nor more than 0.100 inch in thickness.

(*b*) *Spacing of openings.* The nominal widths (*W*) of metal between adjacent openings for various nominal diameters (*D*) of opening are:

D	$\frac{1}{16}$	⅛	$\frac{5}{32}$	$\frac{3}{16}$	¼	$\frac{5}{16}$	$\frac{7}{16}$	⅜	1	1¼	1½	2
W	3/64	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$

(*c*) *Permissible variation in diameter of openings.* Openings ¼ inch or less, not over ±5% of the nominal diameter; over ¼ inch, not over ±3% of nominal diameter.

(*d*) *Permissible variation in spacing,* not over ±20% of the nominal width.

The size of openings in the various sieves used in the chip analysis shall vary according to the nominal (or dominant) size of chips, as follows:

Nominal Chip Size, *inch*	Openings in Screens to be Used for Classification, *inches*				
$\frac{3}{4}$	1¼	1	¾	½	¼
$\frac{5}{8}$	1⅛	⅞	⅝	⅜	$\frac{3}{16}$
$\frac{1}{2}$	1	¾	½	¼	$\frac{1}{16}$

A dust tray shall be provided to catch the undersize chips.

2. *Screen Mechanism.* A suitable shaking or vibrating mechanism (*2*) on which a metal or wooden frame is mounted to rigidly hold the sieves.

3. *Balance.* A balance or scale sensitive to within 0.1% of the weight of the sample to be tested.

4. *Accessories.* One box or can calibrated to measure (*a*) a total volume in cubic feet equivalent to ¼ cubic foot per square foot of effective screening area of one screen and (*b*) a volume of ¾ cubic foot.

A mark time switch, alarm clock, or other time piece.

Test Specimen

SAMPLING METHOD

The sample for sieve analysis shall be taken, by quartering, or by use of a sampler, from a larger quantity of chips representative of the material to be tested.

MOISTURE CONTENT

For precise work, the chips shall be air-dry. However, for other purposes, if the sample of chips is not air-dry, it may be spread in a tray with a wire bottom and dried in an oven for 20 to 30 minutes at 100 to 105°C. If this is impracticable, a longer sieving time may be substituted for the drying procedure.

QUANTITY

The quantity of chips taken for sieve analysis shall not exceed a volume equivalent to ¼ cubic feet per square foot of effective screening area of a single screen, nor be less than ¾ cubic foot in total volume. However, if a trial analysis of the volume taken indicates any of the fractions are more than 35% of the total weight, the total amount shall be reduced by 3% by weight for each per cent these fractions are over 35%, provided that the total quantity taken is not less than 0.5 cubic foot in gross volume.

Procedure

Assemble the set of screens prescribed for the nominal size of chips to be tested in the screen mechanism in the order of the size of their openings with the screen having the largest holes at the top and the dust tray at the bottom. Place the sample in the top screen and start the shaking or vibrating mechanism. The time of screening depends on the moisture content of the chips and the type of mechanism.

Suggested times of screening are:

Type of Mechanism	Air-dry Chips	Damp Chips 15 to 30% Moisture	Damp Chips Over 30% Moisture
	Minutes	*Minutes*	*Minutes*
Vibrating	4	6	8
Shaking or oscillating	7	10	13

The time, as determined by trial, shall be in all cases of sufficient duration that in 1 minute longer the amount passing any screen is less than 2% by weight of the residue on that screen. In no case shall any portion of the sample be manipulated by hand during the sieving operation. Weigh the portions of the sample retained between the screens and the undersize in the dust tray to the nearest gram or 0.002 pound.

Report

The chip sieve analysis shall be reported as the percentage retained on the screen with the largest openings, the percentages retained between the successive screens with smaller openings, and the percentage passing the screen with the smallest openings. The size of openings shall be referred to as diameters. Percentages shall be reported on the basis of the total weight of all fractions to the nearest 0.5% when the fraction is greater than 20% and to the nearest 0.2% when the fraction is less than 20%.

Literature Cited

1. ASTM Standards, 1942, p.992. "Specifications for Round-hole Plate Screens." Designation: E 11.
2. Dickinson, C. L., and Lauer, B. E., "The Screen Analysis of Pulpwood Chips; a Study of Screening Variables," *Paper Trade J.* 114, No. 17: 27-32; TAPPI Sect. 197-202 (April 23, 1942).

Heat Recovery from Digester Blowdown and Relief in Sulphate and Soda Mills*

By J. W. Ogden[1]

Abstract

The purpose of this paper is to describe generally all types of digester blowdown heat recovery systems being used by sulphate and soda mills and to describe a proposed method of recovering low pressure steam from digester relief.

There are four types of heat recovery systems that have been used for condensing digester blowdown steam and transferring the heat to wash water. Each type of system has been used successfully by sulphate or soda pulp mills. If proper care is taken in evaluating the advantages and disadvantages of each system the mill operators should be able to select the best and least expensive type for their particular mill.

1. Direct Contact System

This system (Fig. 1) consists of a direct contact condenser, water circulating pump, accumulator tank, and water regulating valves. The blow steam passes into the direct contact condenser where it is condensed by wash water pumped from the bottom of the accumulator tank. The heated water drops into the top of the accumulator tank from whence it is pumped to the washers or diffusers. The temperature of the water is maintained constant by means of a thermostatically controlled water regulating valve on the inlet line to the condenser. Cold wash water is admitted to the bottom of the accumulator tank by means of a float operated valve. The accumulator tank provides a reserve of wash water so that the condenser can be supplied with water as needed to condense the blow steam.

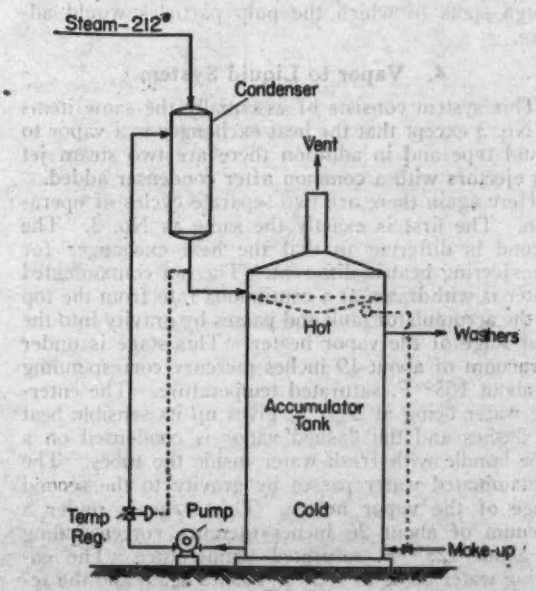


FIG. 1
Direct Contact System

This type of system has four distinct advantages: (1) Simpleness of equipment and operation, (2) low first cost, (3) low maintenance since there are no heating surfaces to clean or replace and (4) flexibility in varying wash water temperature or increasing duty.

There is one disadvantage and that is that the wash water will become contaminated to a varying degree with black liquor and odorous sulphur compounds. This fact has excluded this type of system from serious consideration in many mills. However, there is at least one soda mill and one sulphate mill that are using this method of heat recovery successfully.

In general it is believed that this type of system might work to better advantage in soda mills where odorous sulphur compounds are not encountered.

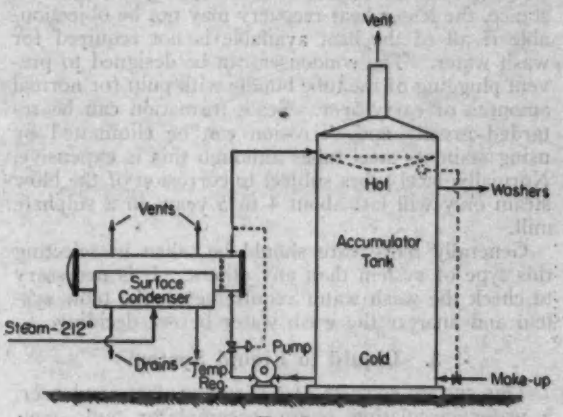


FIG. 2
Surface Condenser System

2. Surface Condenser System

This system shown in Fig. 2 consists of a shell and tube type of condenser with sufficient heat transfer surface to condense the peak release of steam, a water circulating pump, accumulator tank, and water regulating valves.

The blow steam passes into the condenser where it is condensed on the outside of the tubes by wash water pumped from the bottom of the accumulator through the tubes. The heated water passes to the top of the accumulator tank from whence it is taken off to the washers or diffusers. The temperature of the water is regulated by a valve on the inlet line to the condenser. Cold wash water is admitted to the bottom of the accumulator tank by means of a float operated valve.

This type of system has two advantages: (1) Simpleness of equipment and (2) provides clean, hot wash water.

It has four disadvantages: (1) Less heat recovery since blow steam condensate will leave the condenser

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Foster Wheeler Corp., New York, N. Y.

at about 212° F. In other types the condensate is cooled to about 125° F. This difference in condensate cooling represents a loss of about 9% of the heat available for recovery. (2) Tube bundle is apt to become plugged with pulp if carryover from blow system should be high. (3) If wash water contains scale forming material the tubes will scale up rapidly. (4) If wash water contains dissolved gases steel tubes will corrode rapidly.

The above disadvantages are serious but in considering them all factors should be weighed. For instance, the lesser heat recovery may not be objectionable if all of the heat available is not required for wash water. The condenser can be designed to prevent plugging of the tube bundle with pulp for normal amounts of carry-over. Scale formation can be retarded greatly and corrosion can be eliminated by using stainless steel tubes although this is expensive. Normally, steel tubes subject to corrosion of the blow steam only will last about 4 to 5 years in a sulphate mill.

Generally more care should be taken in selecting this type of system than any others. It is necessary to check the wash water requirements, the blow system and analyze the wash water before deciding.

3. Liquid to Liquid System

This system consists of a direct contact condenser, a water circulating pump, accumulator tank, condenser water regulating valve, surface type liquid to liquid heat exchanger, hot water circulating pump, and temperature control valve as shown in Fig. 3.

There are two separate cycles of operation. First, the digester blow steam is condensed intermittently in the direct contact condenser. The water flow is regulated so that the water leaving the condenser is at a temperature of about 205° F. The heated water passes into the top of the accumulator tank and the colder water for the condenser is pumped from the bottom similarly to the other systems. In this case, however, fresh water is not added to the accumulator and the water is recirculated over and over again. The excess water caused by steam condensate is overflowed to waste by means of a loop seal from the bottom of the tank. Second, the hot contaminated water is withdrawn at a continuous rate from the top of the accumulator and pumped through a series of surface type liquid to liquid heat exchangers. Fresh wash water passes through the other side of the heat

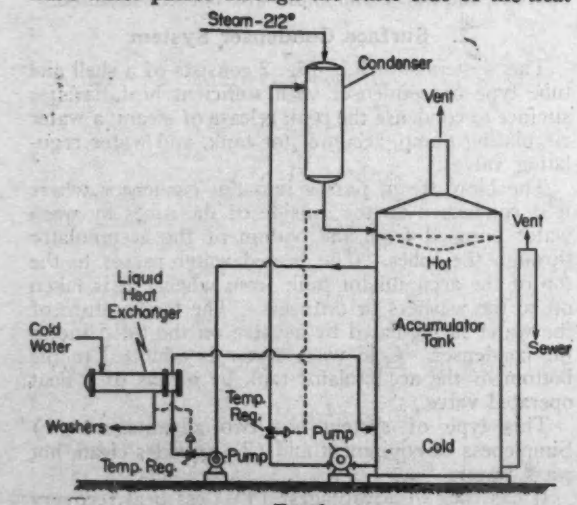


FIG. 3
Liquid to Liquid System

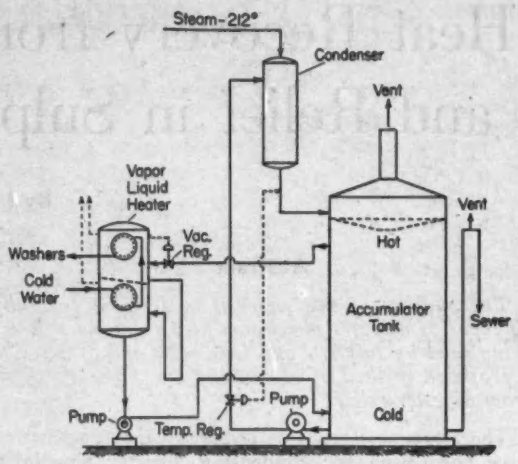


FIG. 4
Vapor to Liquid System

exchangers and is heated to about 150° F. The hot water is controlled by a temperature regulating valve to maintain a constant wash water temperature. The hot water is cooled to about 125° F. and is returned to the bottom of the accumulator tank where it is stored for condensing the next digester blow.

This type of system has three advantages: (1) Provides clean, hot wash water; (2) requires less surface for transfer of heat than the surface condenser system; and (3) recovers more heat than the surface condenser system.

It has three disadvantages: (1) Heating surfaces are apt to become plugged with pulp, (2) heating surfaces may scale up on both sides if water is scale forming, and (3) corrosion may be experienced caused by dissolved gases if heating surfaces are made of carbon steel.

Here again, by using stainless steel heating surfaces, scale formation can be reduced and corrosion can be eliminated. Stainless steel surfaces will also reduce the tendency for pulp particles to plug the heat exchangers as the surfaces will not rust and form rough spots to which the pulp particles would adhere.

4. Vapor to Liquid System

This system consists of essentially the same items as No. 3 except that the heat exchanger is a vapor to liquid type and in addition there are two steam jet air ejectors with a common after condenser added.

Here again there are two separate cycles of operation. The first is exactly the same as No. 3. The second is different in that the heat exchanger for transferring heat is different. The hot contaminated water is withdrawn at a continuous rate from the top of the accumulator tank and passes by gravity into the first stage of the vapor heater. This stage is under a vacuum of about 19 inches mercury corresponding to about 165° F. saturated temperature. The entering water being at 205° F. gives up its sensible heat or flashes and the flashed vapor is condensed on a tube bundle with fresh water inside the tubes. The contaminated water passes by gravity to the second stage of the vapor heater. This stage is under a vacuum of about 26 inches mercury corresponding to about 125° F. saturated temperature. The entering water being at 165° F. flashes again and the resultant steam is condensed on a second tube bundle with fresh water inside the tubes. The contaminated

water is removed from the bottom of the second stage by means of a pump and is returned to the bottom of the accumulator tank. Vacua are maintained by small steam jet air ejectors one for each stage. The flow of water from the accumulator tank to the heater is controlled by a vacuum regulator set to maintain a constant vacuum in the first stage of the heater. The fresh water enters the lower tube bundle in the second stage and leaves the upper tube bundle in the first stage. Since the vapor temperature will be held constant in the first stage the fresh water leaving this stage will be at a constant temperature.

This type of system has four advantages: (1) Provides clean, hot wash water, (2) requires less surface for transfer of heat than the surface condenser system, (3) recovers more heat than the surface condenser system, and (4) heating surface cannot become plugged with pulp because contaminated water does not contact the tubes.

It has two disadvantages: (1) Heating surfaces may scale up on the fresh water side if this water is scale forming and (2) corrosion may be experienced caused by dissolved gases if heating surfaces are made of carbon steel.

The use of stainless steel heating surfaces will reduce scale formation and eliminate corrosion.

The comparative costs of the four heat recovery systems running from low to high would be about as follows: (1) Direct contact, (2) liquid to liquid, (3) surface condenser, and (4) vapor to liquid. If stainless steel heating surfaces are used the comparative costs would be about the same except that the vapor to liquid system would go into third place and the surface condenser system would go into fourth place because of the large surface required for this unit.

Steam from Relief

It must be remembered that when a digester is blown all of the recoverable heat is released in a relatively short time. Figure 5 shows the rate at which heat is released during the progress of the blow. It should be noted that the peak rate is 78% greater than the average rate. Consequently in all condensing systems provision must be made to handle this peak or a loss of heat will result.

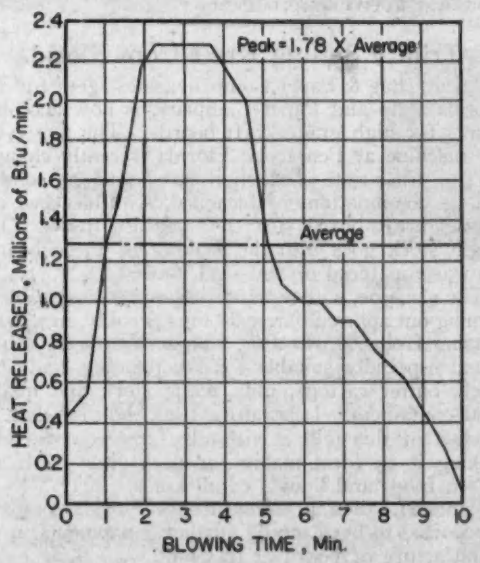


FIG. 5

Digester Blow Characteristics

Digester Data

Digester Size	2200 C.F.
Blow Period	10 Min.
Blow Pressure	100 lb. Gage
Water Equivalent	99,200 lb.
Steam Released	13,200 lb. at 212° F.

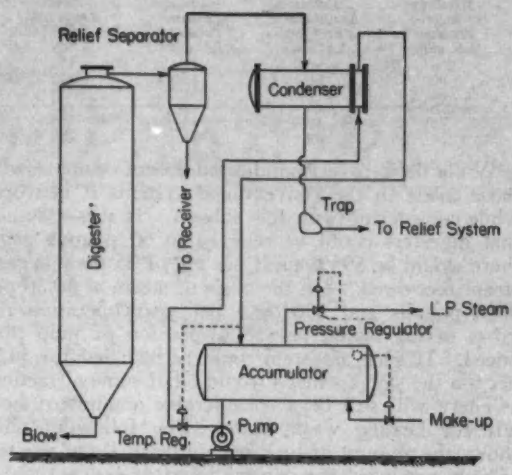


FIG. 6

Low Pressure Steam from Relief

All of the above systems recover heat in the form of hot water which can usually be used in sulphate and soda mills. In some cases, however, more heat is liberated than can actually be used for washing of pulp. If some of this heat could be recovered in the form of steam greater savings would result.

It would be possible to compress a portion of the released steam by means of a steam actuated compressor. However, the maximum economical range of compression would be from 0 to 15 pounds gage and this would require about 2.5 pounds of 125 pounds gage steam per pound of steam compressed. The intermittent release of steam from the digesters would complicate the design and operation of such a recovery system.

Steam at pressures up to 75 pounds gage can be recovered from digester relief with a system as shown in Fig. 6. Before blowing the digester is relieved to a pressure system through a separator and the released steam is condensed in a shell and tube type condenser where it heats water under a pressure of about 10 pounds less than the lowest point to which the digester is relieved. The heated water is stored in an accumulator vessel. It is removed at a continuous rate from the accumulator through a pressure reducing valve to the low pressure system of the mill at a pressure about 25 pounds less than the lowest relief pressure. The accumulator is required here because of the intermittent character of the relief. The drop in pressure from relief to the accumulator tank is needed for a temperature differential across the condenser. The drop in pressure from the accumulator to the low pressure system is needed so that the steam can be stored in the form of hot water. Circulating water is controlled by means of a temperature regulating valve so that the water returning to the accumulator is at a fixed predetermined temperature and pressure. Feed water is admitted as steam is removed from the accumulator by a float operated valve.

The following tabulation shows the amount of steam that can be recovered per ton of pulp produced for various relief pressures. The figures are based on a maximum digester pressure of 110 pounds gage and a water equivalent of 14,500 pounds per ton:

Minimum Relief Pressure Lb. gage	Maximum Accumulator Pressure Lb. gage	Maximum Steam Pressure Lb. gage	Steam Recovered Per Ton of Pulp Lb.
100	90	75	112
90	80	65	222
80	70	55	330
70	60	45	465
60	50	35	595
50	40	25	750

While the recoveries indicated do not compare with those made in the conventional systems it is worth while considering with this subject. If it is assumed that digesters could be relieved to 60 pounds gage, there would be 595 pounds per ton of 35 pounds gage steam recovered. On the basis of steam at $0.30 per 1000 pounds and 330 days per year operation the gross saving would be $58.90 per ton of pulp produced. If such a system could be installed for $125 per ton the savings made would be of some attraction.

There will still be a considerable amount of heat left for heating wash water. The following table shows the amount of heat remaining in B.t.u. per ton of pulp produced for various relief pressures:

Minimum Relief Pressure Lb. gage	Recoverable Heat Remaining—B.t.u. Per Ton of Pulp B.t.u.
100	2,000,000
90	1,920,000
80	1,780,000
70	1,680,000
60	1,540,000
50	1,380,000

It is felt that the recovering of heat in a pulp mill is of the greatest importance. In order to get equipment that will operate satisfactorily and recover the maximum amount of heat in a usable form careful consideration should be given to the problem.

Selling With Color

The McGraw-Hill Book Company has recently issued a new book entitled "Selling With Color" by Faber Birren (244 pp., 5½ x 8½). Following the war emphasis in business will be on merchandising to extend the use of materials and thereby help to create the millions of jobs that need to be filled. In this book color is treated as a business science, and its mysteries are analyzed and measured according to extensive sales records and research studies. The focus throughout is on the American consumer and those forces in color which will sell the most merchandise and hold the largest influence.

Color in industry today may be engineered with remarkable certainty, once the methods are known and applied with intelligence and care. Among the subjects covered are: the colors people prefer, science offers the answer, things that people buy, practical research techniques, the human nature of vision, more power to advertising, packages, displays and interiors, psychology of color, specification of color, review of sales records. In all kinds of merchandising paper plays an extremely important part. Together with color it has been a great influence in directing the buying habits of the consumer.

Copies may be obtained from the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $2.50 per copy.

Practical Psychology

The Macmillan Company has just issued a new book on Practical Psychology by F. K. Berrien of Colgate University (582 pp. 5¾ x 8). Interest in books of this type by executives in industry has taken on a considerable increase during the past few years and will probably continue to do so in the immediate future since at on time has there been the focus on human relations and merchandising, primary problems included in all postwar plans.

The aim throughout the book, which is nontechnical in nature, is to present sufficient background information for the reader to understand the significance of the problem and the broad principles on which the psychologist's contribution is based.

Among the subjects covered are: mental hygiene and guidance, adjustment in old age, employment psychology, training in industry, efficiency in production, morale and rewards for work, industrial accidents, consumer and advertising research, vocational guidance, effective speaking and writing.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $4.00 per copy.

Holyoke Plants at High Level

HOLYOKE, Mass., September 8—The Marvellum and Hazen paper processing plants expect to do considerable work for the government although there have been some cutbacks and cancellations of war contracts, officials reported today. Hard hit by the labor shortage during the war plant boom, these plants, like the paper mills here, have plenty of job vacancies right now.

The Marvellum Company, employing about 135 workers, is still doing 80 per cent government work and expects to continue making special packaging material used on overseas shipping for many more months. They received a new government order this week. Although they have had several cutbacks and cancellations on contracts, the government has been sending them new orders. The company has been under army and navy contract for three years.

Hazen Paper Company, employing 40 workers, reported today it is devoting 50 per cent of its production to government work and 50 per cent to civilian use. The company under government contract for two years, is making grease-proof paper for the army.

Both plants report no difficulties in reconverting from war to civilian production.

Trinity Selling Kraft from Florida

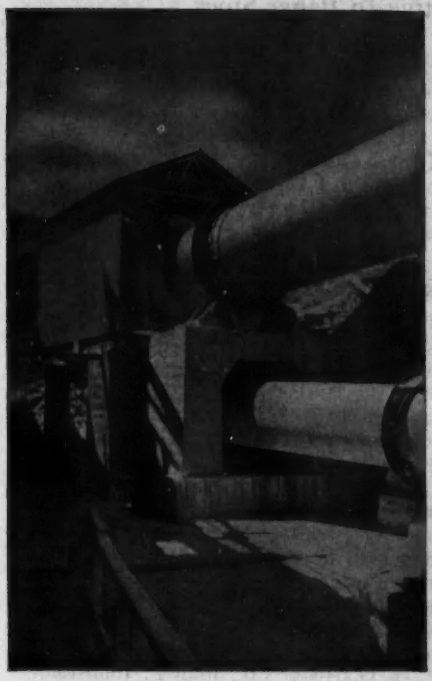
Trinity Bag & Paper Company, sales agent for The Florida Pulp and Paper Company, is now accepting orders for high grade kraft boards. The five cylinder machine at Pensacola, Florida, recently changed over to peace-time production and is making solid as well as combinations of bleached, semi-bleached and natural kraft boards for the specialty trade. Only virgin stock goes into the making of these boards. No waste material of any kind is used.

The machine, with a trim of 88 inches, is capable of turning out approximately 50 tons per day, in calipers ranging from .015 to .040. These boards have been found especially suitable for the printing trade, tag stock, butter cartons, milk bottle stock and quality food containers. Laboratory tests indicate that the product of this mill is virtually free from bacteria, making it an ideal media for packaging fresh and frozen foods and liquids of all kinds.

James H. Allen, president of the Florida company, is reported to be planning further refinements in the manufacture of board at this mill.

Correction: TAPPI Standard T 404 m-44 Tensile Breaking Strength of Paper and Paperboard. In paragraph 1 the equivalent figure for 10 mm. should be 0.4. The figure 7.09 should be 7.11.

PAPER MILL OPERATORS



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DEPENDABLE SOURCE OF SUPPLY

New York Paper and Pulp Market Review

Only Five Government Controls Remain On Paper and Pulp — Imports of Wood Pulp Continue To Rise—Mill Demand For New and Old Cotton Rags Active—Mills Buying Active In Paper Stock.

Office of the PAPER TRADE JOURNAL,
Wednesday, September 12, 1945.

Revocation of all but five paper control orders has cleared up some of the uncertainty for the future. The remaining orders are, however, most important and should be amended soon. These are M-241, 93, 63 and L-20 and 240. The current industrial situation is good and the prospect for a substantial increase in the per capita consumption of paper and allied products is bright. A relatively large expansion and modernization program is taking form within the paper industry and more and better paper products are indicated in the future.

A somewhat easier supply situation is noted in some of many reports received from manufacturers' representatives, jobbers, and general paper merchants this week. With no important reconversion problems to be solved, the removal of existing controls on paper and a more equitable price determination, is all the industry requires to again hit its stride to produce more and better paper products in a larger and more useful variety than in the past.

Paper production for the week ended September 1 was estimated at 95.2%, compared with 89.4% for 1944, with 90.7% for 1943, with 83.3% for 1942, and with 84.8% for the corresponding week in 1941.

Paperboard production for the week ended September 1 was 93.0%, compared with 97.0% for 1944, with 97.0% for 1943, with 78.0% for 1942, and with 80.0% for the corresponding week in 1941.

Wood Pulp

A relatively good supply situation in wood pulp is beginning to be indicated in current reports. The trend approaching to an adequate supply is definitely more clear. Imports are steadily rising and while paper production is high (currently at 95.2%), pulp is concentrated into the manufacture of fewer types, grades and weights of paper than in pre-war years. Prices appear out of line but as soon as the law of supply and demand can operate free of government control, a better situation will be established.

Rags

Demand continues active for new cotton cuttings. Prices are firm at ceiling levels.

Demand for the roofing grades of old cotton rags is still strong under heavy buying by mills. Activity in the construction of new and the modernization of existing buildings is steadily increasing and a very active building period seems assured in the future. Prices are firm at ceiling levels.

Old Rope and Bagging

Demand for Manila rope continues to absorb all available limited supply. This situation is expected to continue until imports of Manila from the Philippine Islands is resumed in quantity.

The WPB reports improvement in the supply of raw jute fiber.

No actual change from the limited and narrow market operations in scrap bagging has been reported this week. Increasing buying is largely expected from automotive consumers but it is a little early for any considerable buying. Prices are unchanged.

Old Waste Paper

Mill demand for waste paper is active at this date. Board mills continue to require larger quantities of mixed, folded news, and old corrugated. Prices are quite strong this week at ceiling levels.

Quaker City Salesmen Meet

PHILADELPHIA, Pa., September 10, 1945—The Salesmen's Association of the Paper Industry met today at a special luncheon meeting in Strawbridge and Clothier's, Eighth and Market streets. The luncheon which started promptly at 12:30 was the first one held in Philadelphia by the Association, and the arrangements were under the direction of T. C. Hanna of Missisquoi Corp., who is Philadelphia chairman. After welcoming the New Yorkers, chairman Hanna introduced Stanley O. Styles of Martin Cantine Company, and president of the association, who then took over the meeting. Besides Mr. Styles, the delegation from New York included E. F. (Bud) Miles of Crocker McElwain Company, eastern vice president; Dr. E. O. Merchant, secretary, past presidents W. L. Raymond of P. H. Glatfelter Co., John P. Johnston, Gaylord Container Corp., Alan B. Helffrick, St. Regis Paper Company, and Walter F. Emholm of Case & Risley Paper Company.

Holyoke Organizes for Safety

HOLYOKE, Mass., September 8—Representatives of Holyoke's paper mills are included in a group at present forming the Holyoke Safety Committee, newest branch of the Hampden County Safety Council.

The committee includes: Francis C. Heywood of the Marvellum Co.; John N. Hazen of the Hazen Paper Company; Henry V. Burgee of the Parsons Paper Company and Harold Martin and Andrew S. Wilson of the American Writing Paper Corporation.

Giving an opportunity for representatives from industries of greater Holyoke to gather monthly to discuss the problem of accident prevention in industry, the Holyoke Safety Round-Table meets on the second Monday each month at the Hotel Essex and is attended by from 25 to 40 local representatives. The present chairman is Andrew Wilson, safety engineer of the American Writing Paper Corporation.

Reports No Employment Problems

Arthur L. Thexton, executive vice president of Clopay Corporation: No employment problem here. Quite the reverse. We are contemplating a work force in our six plants of 700, or about 100 more than in prewar. We have hired 50 since the Japs gave up and plan to hire 25 more in both September and October. We are still in war work, fabricating water-proof paper for shipping, but our normal line window shade, venetian blinds, draperies backlog of orders will take three months to fill.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 12, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand active. Supply situation reported good. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point. Imported 21 to 23 cents.

CAUSTIC SODA—Demand continues very heavy. Deliveries continue delayed. Supply tight in dry grades. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY—Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. Quotations unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings or sales. "G" gum rosin is quoted at $6.74 per 100 pounds, in barrels, at Savannah; "FF" rosin at $6.70 per 100 pounds in barrels, at New York; seventy per cent gum rosin size at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate at this date. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements. Bulk lot shipments steady. Bagged lots still slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market unsettled. Receipts lower. Prices less firm. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand reported good. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

Southern Advance Nets 78 Cents

The Southern Advance Bag and Paper Company, for the year to June 30, reports a net income of $224,303, or 78 cents a common share, on sales of $4,439,150.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*$0.00	@	—
Chip	*50.00	"	—
Sgl. Mla. L.l. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$56.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50% 80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

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5. Removing pitch and lime scale from wires
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7. Cleaning rubber-covered suction press rolls
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Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations
All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shoppetics	1.30	"	1.45
New Shoppetics	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Jays	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¾
Men's Corduroy	.03½
Ladies' Corduroy	.03
Shirtings	.03¾

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.03¼
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25

Old Papers

(F. o. b. Phila.)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)
OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¼
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¼
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¼	"	—
Washable	.02¼	"	—
Khaki Cuttings	.02¼	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—*

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

Price & Pierce Ltd.

WOOD PULP & PAPER AGENTS

for domestic and export

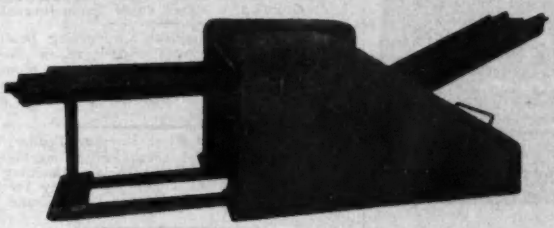
60 East 42nd Street, New York 17, N.Y.

A-1 EXECUTIVE AVAILABLE

Executive now employed seeks greater opportunities. He has a broad and thorough executive and practical knowledge of the paperboard, fibre container and folding box fields, covering a period of 25 years, in sales, purchasing and plant management, including costs and accounting controls. He is qualified to handle a top managerial position in either mill or converting plant end.

Interested in making a connection where the compensation will be commensurate with the results produced through profit-sharing, bonus or opportunity to acquire equity stock.

Address
c/o FIBRE CONTAINERS
228 North LaSalle St.
Chicago 1, Illinois



NO. 1 GIANT RAG CUTTER

This Taylor-Stiles Rag Cutter is built with the same attention as our five-tons-an-hour machine. Its capacity is 2000 # an hour of cut rags.

TAYLOR-STILES & COMPANY 10 Bridge, Riegelsville, N. J.

Since 1901

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MANUFACTURERS

TOILET ROLL CONVERTING MACHINES
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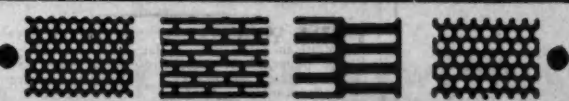
SCREENS of Perforated Metal



The Harrington & King PERFORATING Co.

5652 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

In a mill producing facial or other tissues calling for gentle handling of the web, which winders or rewinders give the best service?
CAMACHINES OF COURSE !!!
CAMERON MACHINE COMPANY 61 POPLAR ST., BROOKLYN 2, N. Y.
MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO 3, ILL.

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel
Positions Now Open

Superintendent four machine mill on printing, book and specialty papers
Four boss, beater engineer and back tender, kraft paper
Mechanical engineers and draftsmen for layout work $6,000-7,000 year
Superintendent, also four boss roofing felt mill
Shipping clerk
Master Mechanics and plant engineers up to $8,000 year
Accountant and office manager
Superintendent groundwood pulp and groundwood paper mill
Works manager paper coating plant $10,000-12,000 year
Salesmen for paper machinery
Technically educated chemist to take charge control dept. $4,000-5,000 year
Paper Mill supervisor experienced making light weight tissues

We invite correspondence (strictly confidential with employers seeking personnel and men seeking new positions. S-13

Wanted
ASSISTANT TO CHIEF ENGINEER

To take complete charge of our Power Plant supervising the operation and maintenance of high pressure boilers, turbines, and auxiliary equipment. Young man with both technical and practical background preferred. Excellent opportunity for growth in responsibilities. Give complete personal and business history in letter of application.

FORT HOWARD PAPER COMPANY
Green Bay, Wisconsin O-4

A small converting plant near New York has an excellent opportunity for a man 30-45 with exceptional mechanical ability.

Must be industrious, neat and able to handle younger people well and more or less of a mechanical genius.

There is an excellent future, ample starting salary and pleasant suburban working conditions.

Give complete detailed information in your reply. Box 45-548 care Paper Trade Journal. S-20

MASTER MECHANIC

to take full charge of maintenance in Asphalt Roofing Plant. Western New York location. Excellent salary for the right man. Give full particulars in first letter. All replies in strictest confidence. Address Box 45-533, Paper Trade Journal. TF

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$2,500-$25,000. Reconversion is creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Delward Bldg., Buffalo 2, N. Y. TF

ADJUSTER—Square, flats, specialty machines. Excellent opportunity with established firm. Give experience. Address Box 45-570 care Paper Trade Journal. S-20

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HELP WANTED —5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED —5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE —5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED —5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES —5c a word. Double rate for heavy face type. Minimum charge $1.25.

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All classified advertisements are payable in advance.

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New York 19, N. Y.

HELP WANTED

SALES MANAGER—Well established house in Philadelphia, Pa. wants man with paper experience and car to sell paper specialties to restaurants, hotels, institutions, luncheonettes, etc. Address Box 45-503 care Paper Trade Journal. S-13

A CONVERTING PLANT with ideas for mechanical improvements, needs some special machine builder available now or near future. Address Box 45-549 care Paper Trade Journal. S-20

HELP WANTED

WANTED—2 Experienced Paper Mill Millwrights for Mill in Western U. S. Address Box 45-502 care Paper Trade Journal. S-13

MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-493 care Paper Trade Journal. TF

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

WANTED—Experienced adjuster and machine tender for Lockport and National Paper Bag Machines, for flat and square bags. Plant in western New York. Address Box 45-498 care Paper Trade Journal. S-20

WANTED—Manufacturing Agents for distribution of chemical product to pulp and paper mills. Several territories available in United States and Canada. Write fully on present lines and territory. Address Box 45-517 care Paper Trade Journal. S-20

WANTED—Sales and Technical Service Representatives for New England and Middle Atlantic States to serve pulp and paper mills. Mill experience and bacteriological or chemical training desirable. Address Box 45-518 care Paper Trade Journal. S-20

WANTED — DRAFTSMAN - ENGINEER for large board mill in mid-west. Permanent position with excellent post war future. In replying, give age, education and experience. Address Box 45-551 care Paper Trade Journal. S-13

MIDWESTERN paper mill undertaking large post war development program, requires assistant paper mill engineer. Inquiries are invited. Address Box 45-532 care Paper Trade Journal. S-13

MERCHANDISE AND SALES MANAGER for nationally known paper bag manufacturing company seeking to develop sales of special purpose and transparent bags and flexible containers—opportunity—replies considered in strictest confidence—state experience and minimum compensation. Our employees aware of this advertisement. Address Box 45-529 care Paper Trade Journal TF

WANTED—Mechanical Engineering Draftsmen with several years experience in chemical plant layout, process equipment design, piping for chemical company in East. State age, experience, salary expected. Address Box 45-554 care Paper Trade Journal. S-27

WANTED—Tour Boss, Machine Tender, Back Tender, Shipping Clerk for one machine mill making folding grades. Extensive rebuilding program under way. Excellent opportunity for right men. Address Box 45-541 care Paper Trade Journal. O-25

WANTED—Two Paper Mill Engineers and Two Draftsmen experienced modern paper mill practice. Also two Mechanical Draftsmen. Permanent work for good men. THE CELOTEX CORPORATION, 205 West Monroe Street, Chicago 6, Illinois. S-13

SALES AND SERVICE ENGINEER to call on trade regularly at least every three months to check on operation of pulp and paper mill equipment for maintenance, sales of repair parts, etc. Must have had shop and mill experience. Address Box 45-543 care Paper Trade Journal. S-13

WANTED—Chemical Manufacturer has openings for Chemists or Chemical Engineers with experience in the Pulp and Paper Industry. Graduate training in Chemistry, or experience in the paper converting, synthetic resins, or plastics fields would be helpful. Address Box 45-559 care Paper Trade Journal. S-27

PAPER CHEMIST—For printing ink development in laboratory of large ink manufacturer. Prefer paper experience. Preferably under 35. No ink experience necessary. Excellent opportunity for advancement. Chicago area. Address Box 45-564 care Paper Trade Journal. S-27

YOUNG MAN—Experienced bookkeeper and typist. Excellent opportunity for the right man. State qualifications, references, etc. Keuka Paper Corporation, Penn Yan, N. Y. S-13

MACHINE DESIGNER preferably with experience in paper mill or paper working machinery. Permanent position with good opportunity advancement. Location Brooklyn, New York. State complete details, age, experience and salary expected. Address Box 45-578 care Paper Trade Journal. TF

WOODPULP SALESMAN WANTED

We have territory for salesman experienced in domestic and imported woodpulp. This is a splendid opportunity for right party to secure permanent, favorable position. Apply (in confidence) to Box 45-515, Paper Trade Journal.

S-13

CLASSIFIED ADS BRING RESULTS

a Must IN MANY A MILL

Superintendents on Hydrafiners. That heading is not a prediction, or the expression of a hope, on the part of Shartle or Dilts or Fleck. It expresses the attitude of various mill superintendents, an attitude that has definitely crystalized into a decision to act.

These men have seen and appraised the work of hydrapulpers, hydrafiners, hydracycling chests, etc. They appreciate the careful mill engineering that they represent—have found it good.

The Engineering Approach. Permit us to suggest that we all discontinue the old practice of thinking in terms of hydrapulpers or beaters or jordans or old style chests as equipment items. Let us rather start thinking in terms of mill needs, then supply whatever those needs demand.

That is the way we would prefer to approach your stock preparation problems. May we be afforded that privilege—the privilege of *engineering* your stock preparation system.

THE BLACK-CLAWSON COMPANY
HAMILTON, OHIO
***Divs.:* Shartle Bros. Machine Co., Middletown, Ohio.**
Dilts Machine Works, Fulton, N. Y.
***Associates:* Alexander Fleck, Limited, Ottawa, Canada.**

Dilts

HELP WANTED

FOREMAN to take charge of paper tube winding department. Located in New England. State experience. Address Box 45-568 care Paper Trade Journal. S-20

WANTED—BOSS MECHANIC. Must have thorough knowledge of paper mill equipment and be capable of handling help. Two machine mill located in Michigan. Address Box 45-571 care Paper Trade Journal. S-13

WANTED — DRAFTSMEN. Young aggressive men with paper mill experience prefered but not necessary. We are building an engineering staff and this will be a real opportunity for the right men. Good living conditions in a small but sound community. Addres Box 45-560 care Paper Trade Journal. S-13

TOUR BOSSES wanted for Roofing Felt Mills located in New Orleans and Metropolitan New York Area. Send complete resume giving experience, etc. to Box 45-565 care Paper Trade Journal. S-20

WANTED—Experienced Napkin and Toilet Perforating Machine Operators. Steady work. Overtime work if preferred. Northern New York. Address Box 45-581 care Paper Trade Journal. S-20

WANTED—Draftsmen experienced in plant layout and building design; draftsmen for high pressure & process piping. New York City office. Address Box 45-577 care Paper Trade Journal. O-4

SITUATIONS WANTED

SUPERINTENDENT — Twenty-five years experience making high grade kraft specialties, envelope, cement sack and imprinted papers, both Fourdrinier and Yankee machines. Address Box 45-510 care Paper Trade Journal. S-13

SITUATIONS WANTED

PAPER SALESMAN at present covering the jobbing trade in Pennsylvania, New Jersey, Delaware, Maryland, Virginia and North Carolina as a mill representative desires to operate over the same territory as a representative for three of four non-conflicting lines. Address Box 45-435 care Paper Trade Journal. O-25

CHEMIST—Technical graduate with B.S. in Pulp and Paper Technology. Experienced in research and development with fine papers. Seeks position with progressive pulp, paper or allied company. Address Box 45-575 care Paper Trade Journal. S-13

PURCHASING AGENT—Veteran of World War I and II, with 20 years experience purchasing and contracting for lumber, pulp and paper mills, and for Army, open for position requiring responsibility and initiative. Familiar with rail and water transportation, salvage sales, handling personnel. Address Box 45-574 care Paper Trade Journal. S-27

BEATERROOM SUPERINTENDENT or foreman, 55 years old. 35 years theoretical and practical experience on most kinds of paper. Good on color. Address Box 45-484 care Paper Trade Journal. S-20

WOOD PULP SALESMAN well acquainted with officials and purchasing agents in Middle West, would appreciate interview. Address Box 45-496 care Paper Trade Journal. S-13

PERSONNEL DIRECTOR—Broad industrial experience. B.A. and L.L.B. Degrees. Extensive union negotiations background. Experienced in all phases employer-employee relationships including job evaluations etc. Address Box 45-561 care Paper Trade Journal. O-11

SITUATIONS WANTED

ASSISTANT SUPERINTENDENT OR SUPERINTENDENT

Age 32. Jobs held—Fourth Hand to Spare Machine Tender, Assistant Superintendent. Technical education. Five years practical experience on book papers, plus five years in management, making kraft specialties, including creped. Fourdriniers. Dependable. Get along well with others. Address Box 45-555 care Paper Trade Journal. S-27

SUPERINTENDENT or Assistant Superintendent—15 years experience in supervision, production, quality, maintenance and technical control on all grades of box boards. Address Box 45-597 care Paper Trade Journal. S-20

MANAGER OR ASSISTANT — Technically educated. Eight years experience in manufacture of asbestos paper and millboard on multiple cylinder machines. Four years as mill manager. Good on cost, production, and handling men. Would consider superintendent. Address Box 45-545 care Paper Trade Journal. S-20

PLANT ENGINEER with long experience in pulp and paper mill engineering, construction and maintenance, also operation of electrochemical and power plants. Address Box 45-580 care of Paper Trade Journal. O-4

TISSUE MACHINE TENDER—50 years old, 32 years experience on all grades of tissue. Facial preferred. Desires change to New England, New York or New Jersey States. Address Box 45-537 care Paper Trade Journal. S-13

SALES REPRESENTATIVE—With long experience in pulp and paper field. Available immediately to a good organization. University education. Age 45. Can give to a firm both high type and forceful representation. Address Box 45-567 care Paper Trade Journal. S-27

FOR SALE

BEATERS
2—2000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

BLOWER
1—50" Buffalo. *Various other sizes.*

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—60" 4-roll Downingtown
1—77" 2-roll—Moore & White.
1—76" 8-Roll Farrel.

CENTRAP
1—Shartle Brothers Centrap.

CYLINDER MOULDS
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.

DIESEL ENGINE
1—60 H.P. Fairbanks Morse Diesel Engine, connected to a 40 KVA Generator.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—Pulmax Drive.

DRYERS
13—60" diameter x 154" face.
1—48" diameter x 94" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
2—8 plate Flat Screens.
1—18 plate Flat Screen, with scraper.
1—12 plate Flat Screen.
2—12 plate Packer Type Flat Screens with steel vats

JORDANS
1—#2 Miami Jordan.
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

MOTOR
1—150 H.P. G. E. Induction Motor—3/60/220-875 r.p.m.—including starting equipment.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—Shartle Brothers duplex 10 x 20 stock pump.
1—Moore & White triplex 10 x 12 stock pump.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.
1—2 Drum Reel—72" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLL
1—72½" Face x 9" diameter (soft rubber).

SAVEALLS
1—Shartle Bros. decker 36" diameter x 60" face, including couch roll.
1—Saveall 36" x 136" cylinder mold, antifriction bearing equipped, including couch roll.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—103" Hamblet Single Knife Sheeter, complete with slitting device.
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36" Koegel slitter and winder.
1—72" Moore & White shaft winder.
1—4 Drum 108" trim Moore & White.

STEAM ENGINE
1—100 H. P. Ames Steam Engine connected to a 75 K. W. Westinghouse Generator.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

TOILET CONVERTERS
2—63" Dietz Toilet Converters.
1—81" Dietz Toilet Converter.

WINDERS
2—65" Cameron Tensions for Winders.

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TEL. BIGELOW 3-3720 S-13

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48" Single Cylinder Machine with all auxiliaries.

Additional Information on request.

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1—2500 lb. Downingtown Iron Tub
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1—1200 lb. Holyoke Wood Tub

CALENDER STACKS
1—9 Roll Lobdell 124" Warren Doctors
1—10 Roll Farrell 104" Warren Doctors
1—11 Roll Pusey & Jones 104" Warren Doctors

CONVERTING EQUIPMENT
1—Bliss Double Head Stitcher
1—Bliss Single Head Stitcher
1—Bliss Box Assembling Machine
1—66" Dietz Towel Winder
4—Waterville Grinders
1—42" Parry Liner & Combiner
1—36" Waldron Reeling Machine
1—39" Dampening Machine
1—36" Brush Coating Machine
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets

DRYERS
5—48" diam.—102" face—2 deck frames.
40—36" diam. 86" face 3 deck frames
18—36" diam. 82" face 2 deck frames
40—28" diam. 96" face 2 deck frames

FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS
1—Moore & White 8 Plate
1—Moore & White 10 Plate
2—Sandy Hill Packer 8 Plate with Scrapers.
1—Sandy Hill Packer 10 Plate
1—Trimbey Pulp Screen 30 ton cap.

JORDANS
1—E. D. Jones Standard motor drive
1—Dillon No. 2 Motor drive
1—Appleton No. 2 motor drive
1—Noble & Wood Monarch Belt Drive
1—Emerson No. 2 Belt Drive

KNIFE GRINDER
1—72" Seybold automatic used one year

MISCELLANEOUS
1—Warren Brake Target with pump
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugent Oil Filters (new)
2—Beloit Fourdrinier Shakes
1—Oster Pipe Threading Machine 2" to 6" direct conn. to motor

MOTORS
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 H.P. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face

PULP EQUIPMENT
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure
2—Improved No. 2 Knotters
1—Nichols-Herreshoff Lime Kiln
1—Williams No. 30 Bark Hog
1—Sumner Disc Barker 72" dia.

PULPERS
1—Sturtevant Bale Pulper with conveyor & motors used three years.
1—Voith Pulper No. 1-20 tons cap.

PUMPS
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6"
1—Oliziti Acid 3" Suction.
1—Frederick 600 g.p.m. 50' head (stock)
1—Midwest 6" stock pump

REELS
2—Pusey & Jones 104" face 18" dia. bowls
1—Pusey & Jones 115" face 18" dia. bowls
1—2-bowl 100" face 20" dia. bowls

RIGHT ANGLE WORM GEAR DRIVES
1—Cleveland 2 H. P.—10 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.
1—Oliver 5 H. P.—51 to 1 ratio.
1—Grant 2 H. P.—33¼ to 1 ratio.
1—Cleveland 2.3 H. P.—40 to 1 ratio.
1—Cleveland 1.2 H. P.—60 to 1 ratio.
1—Grant 2 H. P.—7 to 1 ratio.
1—Philadelphia 2 H. P.—600 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.

SATURATOR
1—Guyton-Cumfer 5 gates

SAVEALL
1—A. D. Wood cylinder 48" dia. 60" face
1—No. 4 Bird with motor and speed reducer 16" diam. rubber couch.

SHEET CUTTER
120" Hamblet Duplex with layboy and 24 roll backstand.

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1—104" Warren two drum.
1—72" Pusey & Jones two drum.
3—42" Cameron 26—20 slitters with motors.
2—50" Cameron 26—20 slitters with motors.
1—56" Cameron 26—20 slitters with motors.

STUFF PUMPS
1—12" x 12" Goulds triplex
8—10" x 20" Shartle triplex
1—8" x 18" Shartle triplex
1—12" x 16" Shartle triplex
1—8" x 10" Shartle triplex
1—7" x 16" Shartle triplex
1—8" x 18" Shartle duplex

TWISTING MACHINE
1—36 Spindle Brownell Twister with motor.

UNWINDERS
1—52" Johnstone Uniform Tension Unwinder with auto, hydraulic brakes. Used 6 months.
1—42" John Waldron Unwinder. Used 1 year.

VACUUM PUMPS
1—14" x 20" Connersville
1—12" x 18" Connersville

WASHERS (Beaters)
1—54" face—45" diam. with rigging
1—52" face—52" diam. with rigging

WET MACHINE
1—84" Improved three roll Hydraulic Enclosed drive (used one year)

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4—Duplex 4 x 10 stuff pumps arranged for motor drive. Operated 3 years.

Box No. 45-552 care Paper Trade Journal. S-27

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Ten dryers 48" dia. x 82" to 86" face, rebuilt, with frames, gears, bearings and new Johnson joints.
98" Rice Barton Calender, Vickery doctors and oil pressure system.

SHEET CUTTERS:
1—58" Moore & White with layboy and backstand.
2—60" Hamblet with Moore & White layboy and backstand.
1—72" Finley cutter, with cast iron knife bar.

FRANK H. DAVIS COMPANY
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HYDRAULIC LIFT TRUCK
108" Lift — 3000 Lbs. Capacity

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1—120" fourdrinier machine

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S-28

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S-20

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One small Beater Complete
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1—Used old style lighter beam for 8" diameter journal Noble & Wood beater
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3—200 KVA —33000-2300/4000 volts transformers
1—250 H.P. slip ring motors & controls—450 R.P.M.—3 bearing base and pulley
80—62" Face steel dryer felt rolls—1—7/16" journals
1—30" Face cast iron taper pulley—2 15/16" bore taper 31"x29½"
4—36" diameter x 83" face dryers
1—6" to 10" Cox & Sons Pipe threading machine
1—48"x48" Noble & Wood beater roll with filling installed
1—40" Noble & Wood impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale too numerous to mention. See our superintendent Mr. O. P. Fussell at our plant in Walloomsac, New York.

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Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
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34" Inman Slitter.
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45" White Automatic Power Cutter.
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110" Hamblet heavy duty Sheeter.
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4 Waldron 38" Paper Reelers
Baling Machines, both hand and power.

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1—Standard Horne Jordan with new shell and plug fillings.
1—12" wide Shartle & Bevis Tissue Paper Shredder. Shredding ⅛" wide strips.
2—Nudson Sharp Napkin Machines, one ½ fold and one dispenser type. Embossing Attachments. Dispenser Machine equipped with two motors and compressors.
1—7-roll 48" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—54"-Left Hand 4 Knife Carthage Chipper with two new sets of knives.
1—72 Lannoye Pulper complete with 40 H/P A.C. motor equipment. A-1 condition.
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
1—Type FC International Folding Paper Box Machine Co.'s Folding and Gluing Machine. Range of sizes on folded cartons 2¾" to 16" when folded flat and 2" to 30" long.
1—30" Standard Waldron Embossing Machine with Levant pattern.
3—55" up-to-date Book Rotary Sheet Cutters complete with automatic Book Layboys.
1—18" x 57" Standard Sheridan Die Press with motor. Rebuilt and guaranteed.

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21 East 40th St., New York 16, N. Y.
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FOR SALE—50" Seybold Automatic Clamp Cutter, thoroughly rebuilt and fully guaranteed. Address Box 45-576 care Paper Trade Journal. S-13

FOR SALE—40" Kidder model S. L. Rotary Slitter, drum rewind, with large quantity of knives. Address Box 45-535 care Paper Trade Journal. S-13

FOR SALE

FOR SALE—1 Schutte Koerting 36" Cast Iron Condenser. Vapor inlet 36", length 94" overall. Designed for 19,500 lbs. steam per hour at 26" vacuum. It requires 1600 gallons of water per minute at 5 lb. gauge. 1—76" Undercut Ream Cutter. Address Box 45-558 care Paper Trade Journal. S-27

FOR SALE—Motor, Slip Ring, Type I Form M 695 Speed, 75 H.P., 3 phase 60 cycle, 40 volts, General Electric, Serial 1009090, subject to prior sale. May be inspected at Schneider Elec. Co., 1 Mercer St., N.Y.C. If interested write to Park Tissue Mills, 303 Fifth Ave., N.Y.C. S-13

FOR SALE—One (1) 400 h.p. Westinghouse, 220 volts, 60 cycle, 3 phase, wound rotor Inducton Motor, outboard bearing and pulley, 390 r.p.m. full load speed, complete with controls, all in good condition. Address Box 45-573 care Paper Trade Journal. S-13

WANTED

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—Fourdrinier Paper Machines, 30 ton daily capacity, trim 80". Address Box 45-572 care Paper Trade Journal. S-20

WANTED—Bundling press for flat and square bags, new or used. James Paper Company, 2058 E. Somerset St., Philadelphia 34, Pa. S-20

NATIONALLY KNOWN old established organization with diversified paper bag manufacturing and selling experience, will purchase outright or invest in established converting business in paper or allied fields. Ample capital available. Address Box 45-531 care Paper Trade Journal. TF

WANTED—1 or 2 cylinder paper machine to trim either 80", 90" or 96" to make light weights. Address Box 45-546 care Paper Trade Journal. S-27

WANTED—Distributors located in Sweden, Norway, Finland, Mexico, Argentina, Brazil, Chile and Australia for product used by pulp and paper mills. Write in detail. Address Box 45-557 care Paper Trade Journal. S-27

WANTED

WANTED

Complete mill to produce writing & wrapping paper. Capacity 10 to 20 tons per 24 hours. Trim desired approx. 82" to 97". One super calender also required. Send complete details of machine including condition, age & selling price.

Address Box 45-569 care
Paper Trade Journal
S-13

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WANTED

4—12 Plate Flat Screens
2—Triplex Pumps 8" x 18"
4—Fan Pumps 8" x 6"
1—No. 3 and 1—No. 4 Nash Pump
1—Bahr Refiner 16", 18" or 20"
2—Synchronous Motors, 150 HP and 200 HP
2—Iron Tub Beaters 1200 to 1500 lbs.
1—Iron Tub Beater 1800 to 2000 lbs.
Advise condition, price and location for inspection. Address Box 45-582 care Paper Trade Journal. S-27

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED—Paper Machine Dryer, Heavy Duty Pulley or Engine Flywheel 56" to 60" face, 42" to 54" diameter. Plastic Film Corporation, Plainfield, Connecticut. S-13

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WANTED

MULTI-WALL BAG MACHINE WANTED. Describe manufacturer, size, range, condition, equipment, price. Cash purchase. Address Box 45-539 care Paper Trade Journal. TF

GOVERNMENT BIDS

PROPOSALS
FOR FURNISHING
PAPER FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a.m., September 17, 1945, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper for the use of the Government departments and establishments in the District of Columbia, for the term of three months, beginning October 1, 1945; deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposal. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedules and specifications may be obtained by addressing A. E. Giegengack, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

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2,500,000 pounds newsprint paper; 900,000 pounds telephone book news; 2,200,000 pounds machine-finish book paper; 3,500,000 pounds offset book paper; 100,000 pounds 50% antique book paper; 400,000 pounds supercalendered book paper; 700,000 pounds machine-coated book paper; 350,000 pounds coated book; 1,600,000 pounds mimeograph paper; 400,000 pounds duplicator copy paper; 150,000 pounds U S M O safety writing paper; 11,650,000 pounds writing paper; 2,885,000 pounds map paper; 715,000 pounds manifold paper; 3,150,000 pounds bond paper; 1,200,000 pounds ledger paper; 1,900,000 pounds index paper; 250,000 pounds cover paper; 140,000 pounds manila paper; 200,000 pounds kraft paper; 600,000 sheets white gummed paper; 250,000 pounds tag board; 130,000 sheets railroad board; 250,000 pounds tan board; 3,000,000 pounds postal card paper; 50,000 sheets red pressboard; 200,000 pounds news board; 230,000 pounds binder's board; 120,000 pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

By direction of the Joint Committee on Printing.

A. E. GIEGENGACK,
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WASHINGTON, D. C.,
September 4, 1945. S-13

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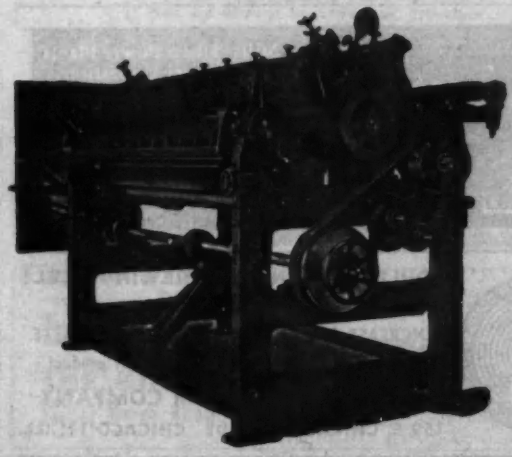

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WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
American Resinous Chemicals Corp.
Amtrol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Derr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Pondevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BUILDERS—PAPER MILLS
Merritt-Chapman & Scott Corp.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Black-Clawson Company
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Packing Products Co.

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATERS
Horton Mfg. Co.

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Pondevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Harvey S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J. Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Murey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Ind.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
H. P. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Loodell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
H. K. Porter Company
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPERMILL BUILDERS
Merritt Chapman & Scott Corp.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gotteman & Co., Inc.
Hof Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Behr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

SCREEN PLATES
Pitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

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International Talc Company

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E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Automatic Transportation Co.
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
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Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
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Union Screen Plate Co.

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E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
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WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
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Dietz Machine Works
Downingtown Mfg. Co.
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Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

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Black-Clawson Company
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Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
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Shartle Brothers Machine Co.

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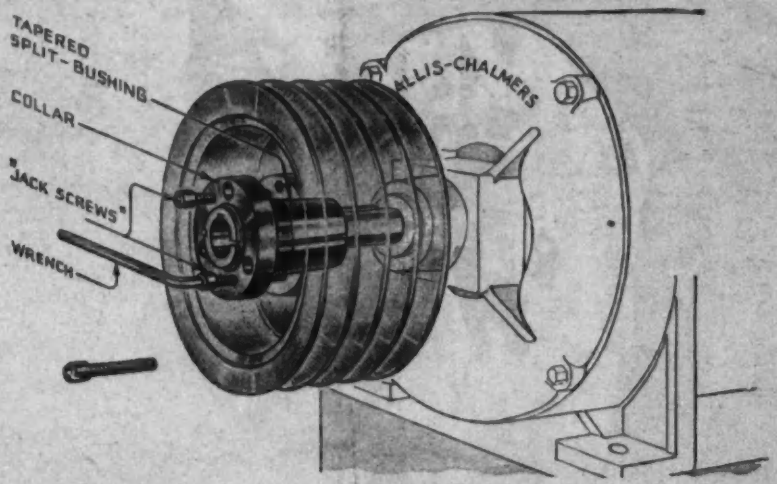
X-Ray View

OF ALLIS-CHALMERS' NEW "MAGIC-GRIP" SHEAVE



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A 1770

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